

# Handling the Young Cerebral Palsied Child at Home

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## FOREWORD

A normal newborn baby is helpless and totally dependent. He is unable to raise and hold up his head, to sit up or to maintain any position against the pull of gravity. He cannot control any positions by himself such as kneeling or sitting, and without support would fall. His head wobbles and he cannot hold it firmly in one position by himself. Gradually, as the brain matures, he begins to control positions against gravity. For instance, when the baby is about 5 to 6 weeks old and is placed on his tummy he will raise his head quite well, and from then onwards the control of his head will improve until, at about 6 months, he can raise it high and look around. From the 5th month onwards the baby can lift his head when lying on his back. Watch yourself when trying to stand up from lying on your tummy—the first thing you will do is raise your head and then put your arms down to push yourself up. From this you will see how important head control is in order to stand up. During working hours all people hold the head properly in line with the neck and the body. It is held there firmly controlled and can be moved and turned freely, and the eyes can look into the surrounding space or at a book, carefully following a line. Again you will see how important head control is for looking around or reading a book. Head control is, therefore, one of the most important factors of human development, both in the physical and mental field.

Another important factor of child development is the ability, starting at around 6 months, to extend and use extended arms for support. We use them for pushing ourselves up to sitting, for getting into a kneeling position, in readiness for crawling and standing up. Even as adults we use the support of our arms if for some reason we have to get on to our hands and knees, or to get in and out of the bath. We also need the protective extension of our arms if, in sitting or standing someone pushes us over and we lose our balance. This shows that head control and the ability to use extended arms are of great importance.

arms and hands only occasionally for support. We hold on to a strap in the tube, or extend the arms to protect the face when in an emergency we suddenly lose balance. In normal circumstances the muscles of the

body work in such a way that we are able to maintain balance in all activities, freeing the use of our arms for many and varied activities and skills, and only rarely for the maintenance of our postures. You can test this for yourself. First stand on both legs and feel the muscles of your thighs. Now raise and stand on one leg and again feel the muscles around the thigh of the standing leg: they feel much harder, their tension has increased in order to make standing on one leg possible. It is necessary to watch and feel the tension, as the change is automatic and takes place without our conscious awareness. There are a great number of such automatic changes of tension in the muscles of the body, which serve to maintain our balance and posture while we move. In babyhood the ability to control the body musculature for the maintenance of balance develops, partially, at about 7 months of age in sitting. This is followed soon after in standing and, later still, in walking. It takes a long time to reach perfection. A child is 3 years of age before he can stand on one leg and throw a ball. At first, as we have seen, the child has to rely on his arms and hands for support and only when he can sit, stand and walk without the help of the arms and hands, will they be free for use in manipulation and skilled activity.

### What goes wrong with the child with cerebral palsy?

Due to damage to the brain in earliest childhood, the development of a cerebral palsied child is retarded, or stopped, and becomes disorganised and abnormal. In many children with cerebral palsy, therefore, one sees insufficient, or a total lack of, head control, and also an incompletely developed ability to use the arms and hands for support, for reaching out, for grasp and manipulation. The child also lacks balance and control of his postures, especially in sitting, standing and walking. The spastic child is stiff. If he is on his back it will be seen that his head is usually pulled back and he cannot raise it, or does so only with great effort. Usually, he cannot bring his shoulders and arms forward, cannot bend his spine and cannot, therefore, sit up or pull himself to sitting. If you pull him up to sitting, his head falls or pushes back. He cannot turn over as the shoulders are pulling back and cannot come forward. When he sits his head is not straight—it either pulls back or slumps forward. He cannot extend his arms for support and falls back or sideways. Even if he has fairly good head control and can extend his arms, he cannot bend his spine and hips and has to use his arms for support. Watch him lying on his tummy. If he is totally involved he will not be able to raise his head or to push himself up with his arms. He is, therefore, unable to

get himself to kneeling and from there to sitting. If a child is only partially involved, for instance the legs only being affected, he may be able to sit up by bringing his head forward and by pulling himself up to sitting with his arms, but he will have to use his arms for support and if he lifts them to reach out for an object he may lose his balance and fall backward or sideways.

Fundamentally, therefore, the motor difficulties of children with cerebral palsy may be regarded as the result of brain damage which interferes with the normal ability to move and maintain posture and balance.

The treatment and management of children suffering from cerebral palsy requires the combined effort of doctors, therapists and parents.

It has long been felt that if the child is to make progress the parents have to play an active and intelligent part in the total treatment programme. This applies especially to a baby or young child who spends most of the time with his mother. Home management, that is, the way the mother handles her child when playing with him, when carrying, feeding, dressing, bathing and potting him, can mean a great deal in furthering or hindering a child's progress. The mother should not be left without detailed advice and guidance because this has often proved an obstacle to successful treatment. A great deal of time should be spent on teaching the parent how to handle her child at home to the best advantage so that any improvement made during treatment can be carried over, used and reinforced at home. Though advice and guidance is most important, the mother should not just be taught what to do and how to do it, but she must learn to understand why she should do certain things, and why she should not do others. In short, she must understand her child, his difficulties and the things he might be able to do if helped in the right way at any stage of his treatment and development. She also needs to know something about normal child development, its importance for learning new activities and in what way damage to the brain has slowed down her child's development or caused it to be abnormal.

This book should be of help to therapists as well as to parents and teachers. It is the result of Miss Finnie's special interest and great experience in dealing with these problems for the past thirteen years as Vice-Principal of the Western Cerebral Palsy Centre, London. No child with cerebral palsy is like another and very general advice that might apply to all children is not of much use. Miss Finnie has attempted to give specific advice on the difficulties and the handling of various types

of children. She says, 'If your child is like this . . . then you do that . . .'. This way of tackling the problem has not been attempted before, and it is this, together with the many illustrations, which makes the book so valuable to parents, teachers and all those caring for these children.

Dr. K. BOBATH  
Mrs. B. BOBATH

### ACKNOWLEDGEMENTS

This book is the outcome of years of work at the Western Cerebral Palsy Centre, London, under the direction of Mrs. Berta Bobath and her husband Dr. K. Bobath, the originators of the Neuro-Developmental Treatment for cerebral palsy, and I take this opportunity of expressing my grateful thanks to them for their personal interest and for the invaluable experience of working with them for so long a period.

I am also indebted to Mrs. F. B. Hall for her personal help and encouragement throughout the preparation of this book, and to Miss B. Cameron-Rose who patiently and willingly typed and re-typed the manuscript.

## INTRODUCTION

### **The physiotherapist and the parents**

Treating and handling a child suffering from cerebral palsy involves tackling a wide range of problems. In this work the co-operation of the parents is vital, for only when parents and therapists work together as a team can a child be given the best opportunities for developing his capabilities however limited they may be. Many years of experience in treating children with cerebral palsy has proved this to be true. It is a mistake for parents to think that, having handed over their child to experts, their responsibilities so far as his treatment is concerned are at an end. Nothing could be further from the truth; rather it should mark the beginning of a partnership between parent and therapist in the over-all care and treatment of the child.

This book will deal mainly with the baby and the child up to five years of age—the period during which a child is handled and trained mainly by his parents. It will be confined to the difficulties most commonly met with, setting out in some detail the causes of the difficulties, and giving advice on how to deal with the problems. Not all the difficulties described will necessarily apply to any one child. Children with cerebral palsy may be spastic, athetoid, ataxic or flaccid (floppy) and they may vary in intelligence from normal to subnormal. There may also be associated handicaps affecting vision, hearing and speech and possibly some physical deformity. All these aspects have to be taken into account when assessing the problems of each child. Furthermore, in many cases, the chronological age of the child does not correspond with his developmental age. A child of four, for example, may not have progressed, so far as his movements and abilities are concerned, beyond the stage of that of a young baby. When considering the examples and suggestions given in this book therefore, it must always be remembered that not all children will be affected exactly in the manner described and that parents will need to adapt the advice given, to the needs of their own child. Many children, for example, will be able to control the position of the head and to use their hands quite well, while others will find it difficult or impossible to do these things. Some children, when lying on their backs, may have stiff legs, while others when in this position may also press their heads and shoulders back on to the support.

While the majority of severely handicapped children may find it difficult to *raise* their heads when lying on their tummies, there will be a few who will find it impossible to put their heads *down* on to the floor or support. It is also realised that the abilities of parents will vary and that some will find the suggestions difficult to carry out or to adapt. Even so, it is hoped that the suggestions will not be discarded too readily but that every attempt will be made to relate them to their own abilities and to those of the child.

The first meeting between the physiotherapist and the parents is of paramount importance. This may be the only opportunity the therapist has of discussing the problems of the child with both mother and father at the same time. At this first meeting the therapist will listen carefully as the parents describe their difficulties when handling and caring for the child at home, and will note the way in which they have been dealing with the problems. She will note, for example, whether a child of one year of age or more is still being treated as an infant of only a few weeks; whether he is being over-protected, having everything done for him; whether the child is both physically and emotionally dependent upon his mother, and so on, all attitudes which will lessen considerably the child's chances of becoming as independent as possible within the limits of his handicap.

Parents will be advised to avoid an over-protective attitude; if treated as a small baby in every situation and supported at all times, the child will not develop, emotionally or physically, to the best of his abilities, any more than would a normal child; rather they should look upon their child as a member of the family unit, helping him to take his place as naturally as possible in the family, and not regard themselves as his sole protectors and entertainers. Having obtained as much information about the child's home environment as possible, the therapist will herself be in a better position to co-operate with the parents—an aspect which is as important as gaining co-operation from them.

At this first meeting parents are often anxious to know what the therapist thinks about their child, asking such questions as: 'Will my child be deformed?' 'How soon will he be able to walk and talk?' 'Will his mind be affected?' and so on. It will be explained that there are no easy or ready answers to these questions for much will depend on the degree of brain damage the child has sustained and on his response to treatment. All that can be said is that the *aim* in treatment will be to help him to become as normal a person as possible within the framework of his handicap.

The next stage in this first interview, therefore, will be concerned with assessing the child's physical condition and planning treatment and



home-management for the immediate future. The therapist will explain step by step what she is going to do and why, and what she hopes to achieve, stage by stage, from treatment. She will stress the importance of careful handling by the parents during the child's first years, and particularly during the crucial first year, for at no other time does a child develop so rapidly as during the first twelve months. Indeed, it is impossible to over-emphasise the value of early treatment, for the earlier the treatment and the younger the child, the less the degree of probable abnormality. Disregarding abnormalities that are not due to cerebral palsy, contractures and deformities are not usually present in the baby. There may be early signs of threatening deformities, such as curvature of the spine, or a tendency for the legs to turn in and cross. Any incipient abnormality which may exist in the very young child will obviously respond better to early treatment than to later treatment when the abnormal condition may have become more established. Recognising the importance of early treatment, it will be clear that the correct handling of the baby by his mother, in support of treatment, is of equal importance. Unless special skill is used by the mother in handling and supporting her child, he may develop abnormal postures on which all his future movements will be based.

As the aim in all treatment is to get improvement in functional activities, the therapist will explain to the parents that treatment should not be regarded as a separate half-hour session each day, but that it should be directly related to the activities of the day. This is why the co-operation of the parents is so important—so much can be done at home that is not possible in a treatment centre. If, for example, a child has difficulty in feeding, such as an inability to close his lips, to chew or swallow, or if he has a tongue thrust, the suggestions given by the speech therapist at the clinic for treating any of these specific difficulties, can be carried out at home immediately *before* as well as *during* the feeding period. Or, if he is able to take food but has not yet started to speak, some time can be spent immediately *after* his meal, when his lips, tongue and jaw have been well exercised, to stimulate the sounds or words suggested by the speech therapist with a view to encouraging speech. Again, if, during treatment, a baby is beginning to acquire balance in sitting, i.e. head and trunk control, a check should be made immediately after treatment to see if it is possible to give him less support when he is being carried. If the aim in treatment is to get better sitting balance with hips bent and legs apart, shoulders and arms forward, the child should be treated *before* he is put on the pot, or on the lavatory or on a chair, and any improvement in his sitting should be noted.

An older child, on the other hand, may be able to sit well and undergo a programme of exercises to teach him how to grasp and pull and to grasp and push. Treatment at home should, therefore, be followed up by encouraging him to make use of any new ability such as, for example, pulling his socks on and off when dressing and undressing.

There are parents who, clearly from the kindest motives, resign themselves to the idea that their child is incapable of any normal development, and thus make it impossible for him to develop any potential ability he may have. Independence for the child must be the aim, but it is an objective that cannot be reached unless the parents support the treatment and are ready to make full use at home of whatever abilities the child has learned during that treatment.

It must be mentioned that many parents who have collaborated in home-handling have come forward with ideas which have proved to be helpful to other parents and to the therapists. Parents should keep a diary in which they note, daily if possible, any signs of new activities, whether or not they are good or bad in performance. This helps the parents to become more observant and interested and the therapist gains valuable information from the record.

A questionnaire which parents are asked to complete in detail will be found on pages 5 to 23 (it will need to be modified for use in different countries). A study of the questionnaire will help parents in their efforts to assess the particular disabilities of their child, but it will only serve its purpose if detailed answers and explanations are given. Blunt answers such as 'yes' or 'no', will have no value.

The essential purpose of this book is to enlist the co-operation of parents and to suggest ways of handling the child at home. It must be emphasised that, although good handling at home is an important and essential adjunct to treatment, it cannot take the place of treatment and should not be regarded as a substitute.

FEEDING

1. In what position do you feed your child? (e.g. is he lying, sitting, in your lap, on a special chair?)

2. Does your child have difficulty in eating certain foods? Indicate those that are the hardest to manage and those that are impossible:

- Liquids, hot or cold, or ice cream.
- Crisp foods, i.e. cereals, raw vegetables, toast, biscuits.
- Slippery foods: eggs.
- Sticky foods, i.e. mashed potatoes, fish.
- Chewy foods, i.e. bacon, meat, chicken.
- Sipping and chewing: soup with vegetables, etc.
- Large bites and chewing, i.e. apples.

Are there any foods not listed that are especially difficult?

3. Are there any of the following difficulties when feeding? If so describe:

- (a) Tongue thrust.
- (b) Gagging.
- (c) Continual sucking.
- (d) Biting immediately something is placed in his mouth.
- (e) Inability to close mouth when feeding.
- (f) Swallowing.
- (g) Biting or chewing.

4. Can your child feed himself with bread, biscuits? Can he feed himself with any other food with his hands? Does food crumble in his hands? Can he feed himself with a spoon?
5. Are there difficulties when your child drinks? If so, which, and what do you do about it? Does he drink from a bottle, through a polythene tube, from a cup, cup with spout, or a spoon? Do you have to pour the liquid down his throat, head backwards? Does he try to hold cup or mug, and if so, with one hand or both?
6. When you feed your child or give him a drink, does he try to guide your hand? How does he hold these? With a fist grip? or between thumb and finger?
7. Can he manage a spoon and pusher? Spoon and fork, together?
8. Can he manage a knife? Which hand? Can he cut up his own food?

<p>9. Can he manage a mug? or cup? Does he drink through a tube or straw? Do you help? Does he use one or two hands?</p>
<p>10. Does he bring the food straight to his mouth or sideways? Is there difficulty in getting the food off his plate? Difficulty in closing his lips to get the food off a spoon or fork? Does he do this with his teeth or lips?</p>
<p>11. Can he take the food up to his mouth? Or does he have to take his head down to his food?</p>
<p>12. Do you have to help him with his feeding? How do you do this? Details please of help given to control him generally, and any specific help given to the jaw, lips and tongue to enable him to chew and swallow.</p>
<p>PLAYING</p> <p>1. In which position does he find it easiest to play? (i.e. sitting on floor or chair; lying on tummy or on side, squatting, kneeling?) <i>Is he always in the same position or does he move about?</i></p>

<p>2. If a baby, does he play, 'peep-bo', 'pat-a-cake', wave 'bye-bye'?</p> <p>Join in nursery rhymes with actions?</p> <p>Describe.</p> <p>Take toys to his mouth?</p>
<p>3. What type of toy does your child prefer?</p> <p>How does he play with them? (e.g. move them, bang them, etc.)</p> <p>Does he use one (which?) or both hands?</p> <p>Can he build, bang together, screw, unscrew, etc.?</p> <p>Does he push and pull toys?</p>
<p>4. Is he destructive or constructive in play?</p> <p>Is he interested in pictures or books?</p> <p>What can he tell you about the pictures?</p> <p>How does he like to amuse himself most?</p>
<p>5. Does he have the chance to play with other children?</p> <p>Does he enjoy the company of other children?</p> <p>Will he attempt to play with them?</p>
<p>WASHING</p>
<p>1. Do you have any difficulty with your child's balance in the bath? Does he need support? Does he fall over when you wash one leg? Does he sit or lie?</p>
<p>2. Does he co-operate when you wash or bath him? How?</p>

FORM 'A'—*continued*

3. Does he have to sit on a stool? in a rubber ring? or have any other support in the bath?
4. Do you have any difficulties when brushing his teeth? If so, which?
<b>SLEEPING</b>
1. Does your child have difficulties going to sleep?
2. Does he go to sleep in a preferred position? Which?
3. Does he move in his sleep? Or do you find him in the same position? Are his bedclothes undisturbed, and do you have to turn him?
4. Does he wake up and cry? How often?

<p>TOILET</p> <p>1. Is he dry?  <i>Day time?</i>  <i>Night time?</i></p> <p>Does he wear nappies?  <i>Day time?</i>  <i>Night time?</i></p>	
<p>2. Is he clean?</p>	
<p>3. Does he indicate when he wants to use the toilet?  How does he do so?</p>	
<p>4. Does he sit safely on the pot or toilet?  Does he sit on your lap or on the floor?</p>	
<p>5. Does he suffer from constipation? What do you do about it?</p>	



FORM 'A'—continued

EMOTIONAL

1. Is he a happy child?  
Are there any difficulties, i.e. crying, tempers, etc.?  
Does he have good days and bad days?

2. Does he dislike being with other people without you?

PRAM OR CHAIR

1. What type of pram or push-chair do you have?

2. What type of chair do you have?

3. Are there difficulties in sitting?  
Does he fall to one side? Which?  
Does he slide forwards?  
Does he push back?  
Can he place his feet on the support?

**SPEECH**

1. Does he make any sounds either in response to your voice or for his own pleasure? Describe.

2. Does he put sounds together, i.e. 'Da-da', 'Ba-ba'?

3. How does he make his likes and dislikes known to you, i.e. facial expressions, gestures, sounds?

**HOME TEACHER OR NURSERY SCHOOL**

If your child is old enough for a Home Teacher or to attend a Nursery School, how many hours a day?

Can we have a report on his progress or difficulties as you see them at home?

Has he had his hearing & vision tested?  
Details please.

## QUESTIONS TO PARENTS: 'B'

(For the child who is starting to manage to help himself)

Name: ..... Date of birth: .....  
 Please answer each question in detail wherever possible

GENERAL	D <sub>1</sub>
1. Is your child predominantly left or right handed? Can he use both hands together?	
2. Can he sit unsupported on the floor or a chair?	
3. Does he rely on one hand for support when he attempts to dress himself or to play?	
DRESSING	D <sub>2</sub>
1. Which garments can he take off?	

2. Which garments can he put on?
3. Which garments can he <i>not</i> manage and what appears to be the difficulty?
4. What help do you have to give your child when undressing? Explain how you do this.
5. What help do you have to give your child when dressing? Explain how you do this.
6. Does your child sit on the floor, on a chair, or stand when he tries to dress himself? Or does he use different positions, according to the clothes he is putting on or taking off? Describe.
7. Can he manage buttons? Which? " " laces? " " fastenings at the back? " " a tie (if a boy)?
8. Does he know left side, right side, top and bottom? Right and wrong side of a garment?

## FEEDING

1. Does your child sit on an ordinary chair?  
If he has a special one, please describe.  
Is a cut-out table used?
2. Does your child have difficulty in eating certain foods? Indicate those that are the hardest to manage and those that are impossible:  
Liquids, hot or cold, or ice cream.  
Crisp foods, i.e. cereals, raw vegetables, toast, biscuits.  
Slippery foods: eggs.  
Sticky foods, i.e. mashed potatoes, fish.  
Chewy foods, i.e. bacon, meat, chicken.  
Sipping & chewing: soup with vegetables, etc.  
Large bites and chewing, i.e. apples.  
Are there any foods not listed that are especially difficult?
3. Are there any of the following difficulties when feeding? If so describe:  
  - (a) Tongue thrust.
  - (b) Gagging.
  - (c) Continual sucking.
  - (d) Biting immediately something is placed in his mouth.
  - (e) Inability to close mouth when feeding.
  - (f) Swallowing.
  - (g) Biting or chewing.
4. Can he feed himself with bread? biscuits? or any other food with his hands? or do they crumble in his hands?

5. Can he feed himself with a spoon? With a fork? Which hand preferred? Does he use a knife?	
PLAYING	
1. In which position does your child find it easiest to play, sitting on the floor, in a chair, on his tummy, side, or kneeling? Does he move about?	
2. How does he like to amuse himself most? Describe. Does he play the same way with the same things each time? Describe. Does he rely on you for verbal instruction?	
3. What type of toys or objects around the house does your child prefer to play with? Describe.	
4. Does he play in an imaginative way, i.e. tea parties? dressing up? washing and putting his doll to bed? Give examples. Does he talk as he plays?	
5. Is he interested in picture books? What can he tell you about the pictures? Describe	
6. Does he draw or paint? With or without instruction? Examples.	

FORM 'B'—continued

7. Does he recognise and can he copy simple shapes: a circle, square or triangle? Can he put together puzzles? Examples.

8. Does he play with other children or prefer to play alone?

9. Does he help with household duties: dusting, laying the table, cleaning the shoes, etc.?

WASHING

1. Can your child wash his hands and face?  
Sitting or standing at the basin?

2. Can he dry his hands and face?

3. Does he brush his own teeth?  
Any difficulties?  
Does he attend a dentist regularly?  
Details please.

#### BATHING

1. Does he have difficulty in sitting in the bath? Have any support or stool to sit on?

2. How much of himself can he wash?  
What help do you give him?  
How do you do this?

3. Can he manage to dry himself?

4. Can he get in and out of the bath?  
How much help do you give and where?

#### LOCOMOTION

1. How does your child get about in the house?  
Do you have him with you when you are doing the housework?

2. What types of chairs can he get on and off?

3. Can he open and close doors; open and shut drawers?



4. Does he have a walker? bicycle? or any type of walking aid?
5. Can he manage stairs? Up and down? How does he do this?
6. Can he walk in the street by himself? Get on and off the curbs? Get on and off a 'bus? Or in and out of a car? If not, by which hand do you hold him? Or in which other way do you help?
7. Does he fall frequently or bump into objects or people?
<b>EMOTIONAL</b> Does he have 'good' days and 'bad' days? When he has been naughty and you are displeased, does he understand? Is he disciplined reasonably to the same degree as a normal child?

**SLEEPING**

*Is your child a light sleeper?  
Does he move in his sleep?  
Is he uncovered in the morning?  
Can he cover and uncover himself, and turn himself in bed?  
Can he get in and out of bed himself?*

**TOILET**

*1. Is your child clean and dry at night?  
During the day?*

*2. Can he manage his toilet by himself?*

*3. If not, how much help do you have to give him?*

*4. Can he manage to clean himself, pull the chain, etc.?*

*5. Have you made any special adjustments to the lavatory itself  
to help him? If so, what?*

FORM 'B'—continued

WHEELCHAIR (if necessary)

1. What type of chair does he have?  
Are there any difficulties?  
Have any special adjustments had to be made?

2. What kind of activity does he do when in the chair?

3. Can he propel the wheelchair by himself?

4. Are there any difficulties in sitting?  
Does he fall to one side? Which?  
Does he slide forwards?  
Does he push back?  
Can he place his feet on the support?

SPEECH

The following is only for children who have difficulty in speaking.

1. Does he use words, gesture, or sounds as a means of communication? Describe.

## GENERAL ADVICE

The therapist's advice on handling is invariably given after she has considered the problems of the child as a *whole*.

Our muscles work in patterns, and the brain responds to our intention by making *groups* of muscles, not single muscles, work. The reason for this will be clear if you carry out the following experiment. Lie on your back and then sit up; you will find that, as you lift your head, shoulders and arms forward, your back will round and this will enable you to bend your hips and so to sit up. On the other hand, if you lie on your back pressing your head against the floor, this will result in your shoulders going back, the lower part of your spine will hollow, and your hips will tend to straighten. In effect, pressing your head back automatically leads to other movements taking place at the same time in the rest of your body. You will fail to sit up because the grouping of the muscle patterns throughout the body are co-ordinated in the wrong way for this particular sequence of movements and your body can neither prepare nor adjust itself to the desired movement.

This simple example is used to show that all our movements are connected. They combine to enable us to initiate, and then automatically to carry out, a whole series of movements.

The muscles of the cerebral palsied child also work in groups or patterns, but these patterns are abnormal and unco-ordinated because of brain damage. They cannot take place unless the child is able to use compensatory patterns, in which case the movement is performed with abnormality and effort. The following sketches illustrate a few of the basic differences between normal and abnormal co-ordinated sequences of movement.

### Points to note in the sketches:

1. (a) When we lie on our back, if we want to initiate any movement away from this position, e.g. roll over or sit up, the first movement is to bend our head (forward) at the same time as we bring our shoulders and arms forward **rounding** the top of our spine. In this way we initiate or facilitate the movement or sequence of movements we are going to do (Figs. 1 (a) and (b), page 25).

(a)



(b)



*Figure 1*

(a) A normal person sitting up from lying on the floor, raising his head forwards and at the same time bringing his arms and shoulders forward, hips and knees bend.

(b) Stage two, sitting up from lying on the floor.



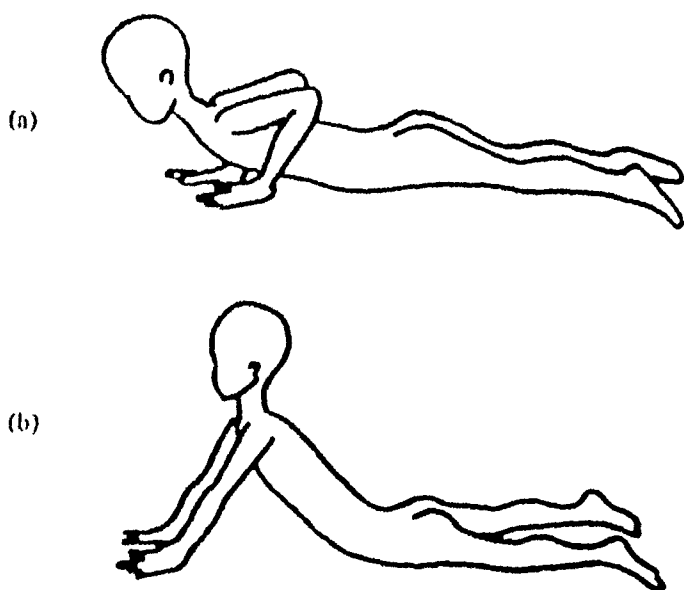
(a)



(b)



(c)

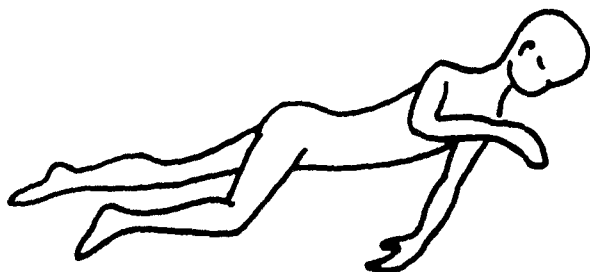


*Figure 3*

(a) and (b) A normal person rising from the floor lifts himself on his arms, at the same time lifts his head and straightens his back.



*Figure 4.* The cerebral palsied child lying on his tummy his head and shoulders pressed down against the floor, arms tucked underneath his body. He is unable to lift his head, back and shoulders, or bring his arms forward to take weight on them.



*Figure 5.* Rolling of a normal person showing movement between shoulder girdle and hips i.e. 'rotation'.

- (b) If we now look at the cerebral palsied child we will see that when he lies on his back his head is often pressed back. Sometimes his shoulders and his arms are also pressed back. He is quite unable to initiate the bending forward of his head and shoulders and the rounding of his spine which is essential if he is to move away from this position (Figs. 2 (a), (b), (c), page 25).
- (c) When we lie on our stomach, if we want to initiate any movement away from this position, e.g. roll over, sit up and so on, the first movement we do is to lift up our head (backwards) at the same time as we bring our shoulders and arms forward extending the top of our spine (Figs. 3 and (a) (b), page 26).
- (d) When the child with cerebral palsy lies on his tummy, his head is sometimes pressed down and often his shoulders and arms also. Again, he is quite unable to initiate the lifting back of his head, the straightening of his spine, or the bringing forward of his arms; all essential if he is to move away from this position (Fig. 4, page 26).
2. (a) In nearly all our movements, for example, rolling, getting up from the floor, walking, or even lifting an object off a table, there is movement between our shoulder girdle and hips initiated or started at one or the other point, a movement known as 'rotation' which, in fact, occurs to some degree in nearly all our movements (Fig. 5, page 26).
- (b) The severely affected cerebral palsied child has no rotation in his movements. This is due to his inability to control the position of his head and to his spasticity, athetosis or floppiness.

The diplegic, whose legs are more affected than the rest of his body, and the athetoid, whose arms are more affected, have some rotation.

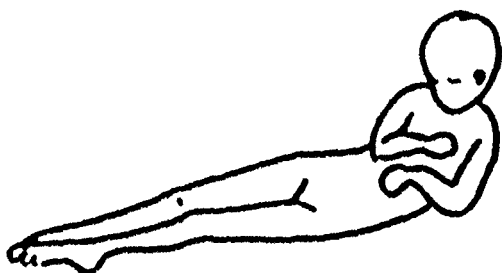
If we look at the diplegic child rolling over, for example, we will see that he starts this from his head, trunk and arms in the right sequence, but he does so with effort which tends to increase his spasticity. This not only causes him to over-emphasise the pulling forward of his head, shoulders and arms but also, at the same time, causes his legs to stiffen and turn in. The value of the rotation between shoulder girdle and hips, in this case, is therefore lost (Fig. 6, page 28).

The athetoid child, on the other hand, starts all movements from his legs, in this case increasing his tendency to extension of his head, spine, shoulders and arms (Fig. 7, page 28).

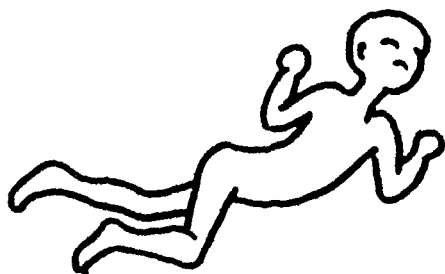
It will be seen from the foregoing that, when attempting to analyse the child's difficulties, it will be a waste of time merely to look at, say, his head or his feet if at the same time we ignore

the rest of his body. We must ask ourselves, for instance, what causing him to hold his head in a certain way and what effect particular head posture is having on other parts of his body (see Chapter 2).

This leads us to our next point. A measure of the child's spasticity shows itself in resistance to movement. For example, when we try to bring his arms forward in an attempt to sit him up, the degree of resistance we feel when we do this will enable us to judge the difficulties with which he is faced, and whether or not



*Figure 6.* Spastic diplegic child rolling over showing the effect on the hips and legs when he initiates the movement of rolling from the head, shoulders and trunk.



*Figure 7.* Athetoid child rolling over, showing the effect on the head, shoulders and arms when he initiates the movement of rolling from hips and legs only.

the movement is completely beyond his power. In other words, we will know how much co-operation we can really ask of him and how much of a movement he can be expected to do. To appreciate the difference in the feeling between a movement of, say, an arm that gives resistance and one that does not, lift the arm of a normal person and move it slowly in different directions. You will realise how light the arm is and that there is no resistance. When you remove the support given by your hand you will notice that there is a momentary pause before the arm falls to the person's side.



Now carry out the same experiment on a cerebral palsied child. In the case of a spastic, note the heavy feeling as you hold his arm; how it presses down and resists movement, particularly when lifted up.

The resistance offered by the athetoid child, in a similar experiment, differs in that while there will be an initial resistance, the arm will suddenly 'give', but when you remove the support of your hand he also will be unable to hold the position of the arm.

The foregoing will serve to demonstrate the importance of 'feeling'; in other words, the difference between moving the arm of a normal person and that of a cerebral palsied child.

The same type of experiment can be carried out with other parts of the body.

### Points to remember when handling the child

If your child is severely affected he will be almost helpless when you handle, bath, feed and dress him, and be unable to move or adjust himself to any changes in movement. The spastic child will be stiff, and become stiffer if not handled well, as you move him; he cannot move sufficiently to balance, which makes him insecure and more tense. The athetoid, because of his involuntary movements and the constantly changing strength of his muscles, easily loses his balance and falls over. The cerebral palsied child is not only limited in his movements which are stereotyped, but is also limited in his reactions and responses to being moved.

Consider how the normal child reacts when you bath, dress, feed, carry him and so on. He moves *with* you rather than against you, it is easy to lift his arms up to wash or dress him, his hands are not tightly fisted—they open easily. If you put anything over his head—his jersey or shirt, for example—he automatically pushes his head through; if you part his legs to put on his nappy he offers no resistance as you move him. When you pick him up he holds up his head; if he feels insecure he can immediately grasp and hold on to you. His natural self-protective reactions and his ability to balance enable him to adjust and change his posture if he is uncomfortable while being handled. For example, most children dislike having their noses or ears cleaned and will move and dodge in the hopes of avoiding this attention; if this does not have the desired effect they use their hands to push mother away. The cerebral palsied child cannot do these things. All that he can do is to cry and become stiff and frightened. If he is of the 'floppy' type of the cerebral palsied he will have to be supported and held everywhere or he will fall.

Because of this we must handle a cerebral palsied child slowly, and give him a chance to make his own adjustment as we move him, supporting him where and when necessary, but waiting and giving him time to do whatever he possibly can by himself. This is difficult and the therapist will help and advise on the correct way of doing so.

It is most important, when anything is being done for the child, that he should not be passive; let him see what is being done and talk to him about it. Name the parts of his body, and describe his clothes and their colour as you dress him and the movements he is making. For example say, 'help me to push your foot into your shoe,' and 'now let's do the same thing with the other foot,' or, 'lean forward so that I can get your coat around your shoulders'.

By these means not only is the child being taught to understand language, but he is learning something of the relationship of one part of his body to another, all contriving to give him experiences of normal movement. This attitude should be applied to all everyday activities. A cerebral palsied child takes far longer than a normal child to understand and to store information; therefore constant repetition is of real value. It should always be borne in mind that he does not have the same opportunity as a normal child of learning by trial and error and by experimenting.

One should try at all times to enlist the child's co-operation. Within reasonable limits ask him what he would like to wear, what and how much he would like to eat. We all like to sit back and have things done for us. The more difficult a task, the greater our readiness to hand it over to someone else. How much more does this apply to the cerebral palsied child? He enjoys attention and becomes used to having everything done for him. Parents quite naturally get used to doing everything for him and, in time, stop expecting any help from him. Time is precious, even more so when there are other children in the family; but no cerebral palsied child will ever become independent unless he is given an opportunity to try. To compete is always stimulating so, whenever possible, let your child dress, wash and eat with the other children in the family; in this way he will be much more inclined to try to help himself.

Admittedly some children's handicaps make it impossible for them to do very much for themselves, but with correct help and guidance and the avoidance of excessive effort on the part of the child, he will learn to do more and more for himself. We stress the need to avoid excessive effort, as failure can lead to tenseness and frustration with the probable result that the child will give up.

Even if a child cannot use his hands or speak, he is sure to have some way of indicating what he wants and in this way he can co-operate,

for example, while you play with him. If, for instance, you are building a house with bricks for him, have a book with different pictures of houses and get him to act as 'foreman' and 'direct proceedings'. He can choose the type of house he wants you to build, decide on the type of roof, the number of windows, and where he wants the doors to be, and so on. When the house has been built he will feel that he has taken an active part in its construction, as, in fact he has.

### Speech

Considering, in brief, the problems of speech—which is often delayed or difficult for the cerebral palsied child, no attempt will be made to offer advice for children who suffer the additional handicap of deafness or the partial handicap of being able to distinguish only certain qualities of pitch or tone. It must be recognised that hearing disorders call for highly specialised treatment and advice as to how parents should communicate with a baby from birth onwards by touch and words.

Speech is a very complex skill. The muscles and organs used for it are secondary; the primary purpose of these organs is to enable us to breathe and feed. In fact a good 'speech pattern', it is important to remember, is based on good feeding and breathing patterns.

Crying, babbling and cooing are forms of expression for a baby, indicating his discomfort, anger or pleasure. He tends to make noises when he is happy and contented, especially when he is being nursed or at feeding times. It is therefore important that meal times should be times of enjoyment, for at this time the child has a very close emotional link with his mother. Often, after he has been fed and is happy and close to his mother, and, having used his lips and tongue in feeding, a baby starts playing with sounds—a preparation for speech. It is noticeable that if anything happens to disturb this close relationship the child tends to stop reacting in this way and may even cry. As he grows older, meal times become more of a social occasion with the rest of the family; he expresses his satisfaction or dislike of his food, saying 'yes' or 'no' when offered food, he names the food and makes simple requests such as 'more', 'give me', and so on.

If a cerebral palsied child is to learn to speak, patience is essential. We must wait and listen, and give him a chance to try to speak and express himself at his own speed. If we are satisfied merely to interpret his nods and looks, why should the child be expected to make the effort, which is obviously called for, to speak, if he can get what he wants without trying to express himself? Again, the child should *not* be spoken

to in baby language. By doing so we rob him of the opportunity of increasing his vocabulary and of understanding the meaning of words that he will need when he eventually starts to speak.

Listening is difficult for many cerebral palsied children, one reason being a lack of ability to concentrate, a point we sometimes overlook. The child not only needs to listen to the words we speak, but to the emphasis that we put on certain words, the variation in tone we use and so on. Try, if you can, to set aside a time each day when you speak and listen to your child alone without the radio or television; this will give him a chance to attend to what you say and to interpret the meaning of your words. If you are playing with him and he makes a new sound, make him aware he has done so by showing him that you are pleased. Repeat the sound several times and then ask him to do it with you, helping him with his specific difficulties, as your speech therapist advises. In this way you will reduce the effort needed and the difficulties the child so often has when he is asked to make a specific sound.

If he cannot speak, or can only say a few words with difficulty, he will be unable to ask the many questions which the normal child asks and will be deprived of the opportunity to learn by asking questions. You can help him by talking to him about the things you are doing. Give him a running commentary as you cook and do the house work, and while you dress or wash him, you yourself asking the questions and giving him the answers. Do this when you take him for a walk, or look out of the window, and describe to him what is going on.

If and when he starts to talk, encourage him to describe what he sees in the room. If he can walk or crawl, get him to name the objects he has passed, or, as he plays, to talk to you about *his* interests and what he is doing or plans to do. See if he can remember what you bought at the shops and what he saw when he was out for a walk—verbal contact is essential if sounds and speech are to be achieved. If he always remains in one room, or goes out for the same walk every day, his experiences of daily life will be very limited. These are but a few suggestions which may help and encourage him to speak and to understand the world around him.

### **Head control**

As you will have read in the Foreword of this book head control is a basic necessity in the normal sequence of development. It is the first step towards more complex movements and skills. In the normal person it is the basis for all movements and activities, whether they be automatic and spontaneous movements of balance or voluntary movements.

Whenever we move we adjust the position of the head, holding it steady in midline to the body, enabling us to focus properly. The impaired head control of the cerebral palsied child, on the other hand, results in the field of vision being uncontrolled, making it difficult for him to focus his eyes. The *athetoid* child has the greatest difficulty in directing his field of vision and focusing because of his lack of head control and his involuntary movements. He is unable to move his eyes unless at the same time he moves his head. The *spastic* child also has difficulty with eye-hand control because the abnormal movements of his head result in abnormal reactions throughout his body. For example, some spastic children (and athetoid children) cannot use their hands for grasping unless the head is turned in the opposite direction, so preventing them from looking at what they are doing.

When any cerebral palsied child begins to use his hands, first make sure that his head is in mid-line with his body, and encourage him to use both hands also in mid-line and to look at what he is doing, whether he is playing, dressing, feeding or washing. When you ask him to turn his head to look at something, see that his head is really turned. Too often the child will just turn his chin and bend his head to the opposite side, making it very difficult to use his hands purposefully.

When you start to teach your child to feed, dress or wash himself, it is important to realise that even a normal child needs assistance in these activities for some years before he can do them by himself. Examples of these stages in a normal child are given in the chapters dealing with those subjects.

### Social development

If the cerebral palsied child is to adjust himself to the community of school and later to the community of the world, he must first learn to take his place as part of the family at home. Personal contact with the family and neighbours is obviously very important for the child; if he is segregated it can only hinder his social development, as it would even in a normal child. Special care should be taken around the eighth month for it is at this time that a baby becomes 'anxious', continually wanting his mother and crying when he sees strangers. This is a normal stage of development generally coinciding with the beginning of a concept of himself in relation to others. The child needs help if he is to make this necessary adjustment.

Owing to his physical disability and the added difficulty of being unable to communicate, the cerebral palsied child is sometimes ignored, or alternatively becomes the centre around which the whole family revolves. Both these attitudes are detrimental to his personality and to his

social development. He should be encouraged to take part in the life of the family and be given the opportunity to appreciate both the needs and interests of others. To help him reach this stage in development it is essential to understand clearly his abilities and his disabilities. Avoid setting him objectives which are unrealistic and which will inevitably lead to frustration and failure. Be satisfied with gradual success, praising the child for the things he does well, not overlooking his somewhat difficult attempts to speak. We should continually remind ourselves of the immense efforts the child has to make in many cases even to move. Our aim must be to encourage him gradually towards independence, thinking of others and not only of himself. In this way he will have a chance of becoming an integrated personality, taking his place as a member of the family.

## THE DEVELOPMENT OF MOVEMENT

The cerebral palsied child, in common with all other children, learns a movement by 'feeling' it and by trying it out. Whereas the normal child has a natural or in-built ability for adapting his movements to his own satisfaction, the cerebral palsied child is limited to few and inadequate movements, movements that become stereotyped and on which he will base whatever skills he may acquire later. If a child uses, to begin with, only wrong patterns of movement, he will continue to use them and perpetuate the original faults. This will prevent a more normal physical development, and the repetition of these faulty movements may lead to contractures and deformities.

The control of all body movements rests in the brain and is exercised through the eyes, ears, skin, muscles and joints. If, as is the case with the cerebral palsied child, part of the brain control is damaged, development is disturbed and retarded at an early stage. The fact that damage can affect different parts of the brain means that in some cases the arms will be more affected than the legs, and in others vice versa. It may result in one child being able to hear and to see but to have difficulty in moving, or, in another child, being able to move fairly normally but being unable to hear. Whatever the case, the child will start by using the abilities he has, however abnormal they may be, resulting in an 'uneven' development, as many of the stages of normal motor development will be left out.

For instance, if the child cannot lie on his tummy and support himself with his arms and lift his head, he may not learn how to hold his head up or to sit or to walk with a straight spine. If he can only turn to one side, he will not use the other side and thus his body will develop unevenly. If he can only stand up by stiffening his legs, he will then

...and his hips sufficiently and can sit only by rounding his back to avoid falling backwards, he will be unable later on to straighten his back when he is standing. If his legs are so stiff that he cannot kneel and crawl on the floor, he will progress by pulling himself along with his arms. His arms will then bend too much and in time he will have difficulty in reaching straight out to grasp objects or to support himself on straight arms. If a child cannot stand and balance, he cannot be expected

*Figure 8.*

Normal child of a year old, standing.



(a)



(b)



*Figure 9*

- (a) The young spastic diplegic child standing. This posture is one of flexion. His head 'pokes' forwards and up to compensate for the lack of extension in his trunk and hips. His arms are usually bent and press down and forward at the shoulders. His legs turn in and are held together, his standing base is very narrow making balance difficult and in many cases impossible. Some children do manage to get the foot of one leg flat on the floor as illustrated, but in doing so bend the hips even more and the whole of the pelvis is pulled back on that side.
- (b) The young hemiplegic child standing. His posture is asymmetrical, all his weight is on his good leg. The affected arm bends and turns in at the shoulder which presses down and his trunk bends on that side. The leg is stiff and turns in at the hip, the pelvis is pulled up and back; his foot is stiff and the ankle does not bend so that he takes weight only on the toes and ball of his foot. In some cases the head is also pulled towards the affected side.



to walk in a normal way. Without balance he cannot lift his leg to take a step forward, unless he is holding on to a support.

The following show the difference between the normal child, the spastic and the athetoid, both in standing and in taking a step.

### Standing and taking a step

#### (a) THE NORMAL CHILD

The age at which a normal child starts to walk varies considerably. Generally at about one year by which time he has some balance in standing, if only briefly, and has reached the stage of starting to walk whilst being held by one hand. He balances at this time by keeping his hips and knees slightly bent, and by standing on a wide base, his feet flat on the floor with his heels down.

He is now capable, when held, of shifting his weight on to one leg setting the other free to take a step. Fig. 8, page 36, shows the normal standing position of a year-old child.

#### (b) THE SPASTIC CHILD

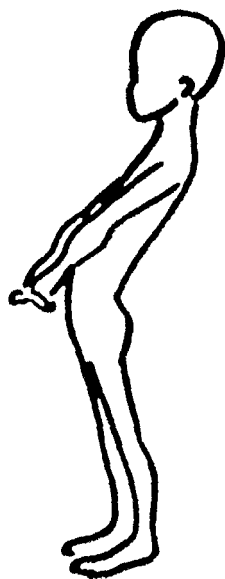
The variations in standing of the spastic child are manifold. Figs. 9 (a) and (b), page 36, show two of the more typical positions. It is obvious that standing on such a narrow base as in Fig. 9 (a), with the weight on the inner side of the feet, means that balance and the shifting of the weight sideways or forwards is impossible.

If you hold the child under his arms and 'walk him', all he can do is to fall forwards from one leg to the other, his weight falling more and more on to his toes and his legs becoming stiffer and later crossing.

One might possibly be encouraged at the thought that in this way the child is beginning to walk. Unfortunately, this is not so, as the abnormal pattern of movement involved in this so-called 'walking' will simply increase the difficulties of the child in his efforts to stand or later to walk normally. Other spastic children stand so stiffly on both legs that even when you lean them forward they cannot bend at their hips to take a step forward.

#### (c) THE ATHETOID CHILD

As we have pointed out the athetoid child has difficulty in maintaining his weight against gravity, and when standing either collapses or falls backwards. For this reason he has no standing balance, and cannot shift his body weight sideways or forwards. If he is able to stand and if one of his legs is lifted, the other leg will bend and he will collapse. Fig. 10, page 38, shows a typical position adopted by the older athetoid



*Figure 10.* The standing position sometimes adopted by the older athetoid child; by holding his arms and shoulders forward in this way he can keep his feet flat on the ground and his hips straight. This enables him to balance sufficiently to walk although his legs will remain stiff and straight.



(a)



(b)



(c)

*Figure 11*

- (a) A normal child lies on his back making a 'bridge', his head and shoulders remain on the floor, he does not push himself back.  
 (b) and (c) The athetoid child also attempts to make a 'bridge' but is unable to extend his hips completely and immediately pushes himself backwards—his head and shoulders are pushed against the floor the arms bent as in fig. (b) or stiffly extended as in fig. (c).

child to enable him to keep his shoulders and arms forward, hips and legs straight.

What is known as the 'walking reflex' is generally present when a baby is born. Possibly a more descriptive term would be 'high-stepping', for when the sole of one foot of a new-born baby touches something solid, the other leg bends and then extends, giving the appearance of walking; this pattern of movement is also seen when a baby lies on his back and kicks. At about four weeks this type of reflex is no longer evident. If you 'walk' a young athetoid child by holding him under the arms, the movement he is making is identical with the 'reflex' found in the new-born child, and if persisted in will seriously impair the child's prospects of walking because even the normal child learns first to stand safely on both feet before he starts to walk.

The next two examples are of movements which, if constantly repeated by the child in an abnormal way, may eventually lead to contractures and deformities.

### **Pushing himself backwards on the floor**

#### **(a) THE NORMAL CHILD**

At about eight months of age the baby, when he lies on his back, bends his knees, puts his feet flat on the support, lifting his seat to make a 'bridge' (See Fig. 11(a), page 38).

#### **(b) THE YOUNG SPASTIC CHILD**

This is a movement seldom seen in the spastic child. He does, however, sometimes *try* to push himself backwards by pushing against an upright surface such as a wall, the side of a chair or the end of the bath. Unable to bend his feet up sufficiently to place them flat on the surface he pushes with his toes, reinforcing his tendency to have stiff legs and hips which, if permitted, will result in the child being unable to stand or walk other than on his toes.

#### **(c) THE YOUNG ATHETOID CHILD**

The athetoid child, whose legs are less affected than his arms, often finds that to make a 'bridge' and to push himself backwards, is the only way in which he can move around the house.

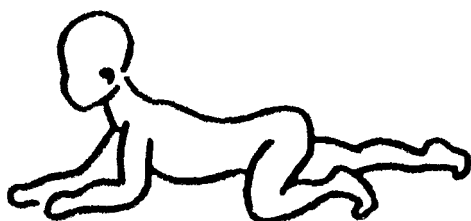
The movements of his legs and hips are similar to those of the normal child but, as he arches his back, he *also* pushes his head and shoulders back at the same time. This abnormal pattern will increase his general tendency to extension and retraction of his head, shoulders and arms, preventing him from lifting his head in order to sit up, reach-

ing forward with his arms and hands, taking weight on extended arms and, later, from sitting or balancing in any position (see Fig. 11 (b) and (c), page 38).

### Creeping on the tummy

#### (a) THE NORMAL CHILD

The normal child at about eight months moves on his tummy by pushing himself backwards with his arms, and by pivoting. A little later he pulls himself forwards on his tummy by using his arms in a



*Figure 12.* The normal child creeping on his tummy. Note how the head is held up and the back straight. He moves forward by using the opposite arm and leg.



*Figure 13*

(a) The creeping of the spastic diplegic child. Note how the pulling of the arms towards and into the body, bends the head and rounds the back, at the same time making the hips and legs stiff and straight.

‘swimming movement’ and pushing with alternate legs. See Fig. 12, page 40, noting that, at this stage, his head and spine are extended and each arm and leg is used alternately—progress being helped by using the toes to push himself forwards.

#### (b) THE SPASTIC DIPLEGIC WHO IS ABLE TO USE HIS ARMS

Look at Fig. 13 (a), page 40, and compare the posture of the normal child in creeping, with that of the spastic diplegic who can only move along the floor by ‘pulling’ with his arms. The pulling of the

arms down and across the chest will gradually lead to stiff extension and crossing of the legs and feet, making it impossible for him later on to stand with his legs apart and with his feet flat on the ground.

The young spastic child, *who is not so stiff and is still able when creeping on his tummy to move his legs alternately as a normal baby does*, and has the ability to bend his hips, legs and knees, should of course be encouraged to do so. Directly it is noticed that all creeping movements are taking place by use of the arms only, without moving the legs, these must be stopped, for if not, the child will eventually only be able to drag himself along on his tummy by literally pulling his legs along with him. If allowed to continue to move in this way the child will have difficulty in moving away from this position, and he will be incapable of any sequence of movement that requires the bending of



(b)

Figure 13

(b) The Infant Adjustable Crawler.

the hips and legs and taking weight on extended arms, such as, for example, getting into the 'all fours' position to crawl, or to sit and stand up

It is obvious, that care should be taken to ensure that the spastic diplegic child, at this stage of his development, is not allowed to adopt this way of creeping.

The type of crawler shown in Fig. 13 (b) may be found useful for some spastic children, i.e. those who cannot support themselves on straight arms, are unable to crawl and can only move around creeping. The crawler gives the child minimal support and enables him to bend his hips and therefore move his legs alternately.

It is important to see that the child really *reaches forward* with his arms and takes weight on his hands as well as on his knees. If he starts pulling with his arms and moves forward too quickly he will be inclined to push with his feet and his knees come off the floor, alternate movements of the legs will stop and his hips will become stiff.

Psychologically the crawler may also be useful for some *athetoid* or 'floppy' children. If the movements of the athetoid child become rather disorganised and abnormal there is no need to worry, as these children do not become stiff or fixed in any one position.

In the case of the athetoid child who has stiff arms turned in at the shoulders (see Fig. 2 (c), page 25), and held under his body with fisted hands when lying on his tummy, he *cannot* be expected to move on a crawler.

Your therapist will give you a demonstration in the use of a crawler before you take it home and she will be able to advise on its specific use.

Finally, in all cases, it is advisable to limit the length of time in which the crawler is used. The same comment applies, of course, to most types of 'aids'.

#### (c) THE ATHETOID CHILD

The athetoid child is generally incapable of creeping or crawling as he cannot lift or hold up his head when lying on his tummy and cannot take sufficient weight on his arms. He can move, therefore, only by pushing himself along on his back as described on page 39.

We must realise that the cerebral palsied child will have to use excessive effort in his attempts to move and that the choice of movement will be limited. The very fact that he can move at all is good but the way in which he does so must be watched carefully. Abnormal movements such as, getting around the floor by 'bunny hopping', in a spastic child who is unable to stand and to walk by himself, should be discouraged. Continually moving in such a way will increase the tendency of the hips to turn in and of the hips, knees and ankles to bend, eventually making standing and walking impossible. Care should be taken to reduce the length of time in which he moves in this way and every effort made to encourage an alternative method of getting about, such as a tricycle, a child's motorcar, or perhaps one of the roller boards on which he can sit (described in Chapter 8).

The jerky and uncontrolled movements of the athetoid child are just as great a handicap to him as are the limited movements of the spastic child. When he moves in an abnormal and disorganised manner—for instance, by getting around the floor by pushing himself about on his back—he makes it impossible to sit, stand and walk later on. A good alternative way for him to move around which should be encouraged is to let him lie on his tummy on the roller board. This will help him to bring his arms forward, learning to take his weight on both

*hands* as he pushes himself around, at the same time encouraging him to lift and control his head, *extending his back*, a pattern which he will need later on when he sits, stands and walks.

Some athetoid children may learn to move about the floor by 'bunny-hopping' if they can use their arms for support and lift their heads. This method of moving around—if the athetoid child cannot stand or walk by himself—need not be discouraged so much as in the spastic child, as they do not risk the same danger of developing flexor deformities in their legs. It is also a practicable alternative to pushing themselves along the floor on their backs.

Finally a few examples to illustrate how, by *our handling* of the child, we can inadvertently aggravate the child's abnormal movements, making the spastic child stiffer and resulting in the athetoid child having more involuntary movements.

### Bouncing on the floor

#### (a) THE NORMAL CHILD

Study Fig. 14, page 44, and you will see that the child's head is in mid-line, that his body is straight and that his arms and legs are in a normal position—he is thus symmetrical. Note that as he is lifted into the air his legs are drawn up, then straighten a little as he is lowered. As his feet touch the ground he momentarily takes some weight, although he soon sags at the hips and knees. Eventually, as he grows older, his legs will straighten in the air and his feet will be in a position to take his weight.

#### (b) THE SPASTIC CHILD

Now compare Fig. 15, page 44, which illustrates the abnormal position and pattern of movement of a severely affected young child.

Note that he is not symmetrical. The head is not in mid-line and his body is not straight. Note also that as he is lifted into the air, because the head and trunk are not symmetrical the pelvis becomes pulled up and back on the one side, and the hips and legs extend and turn in—in some cases they may even cross; his feet extend downwards; his shoulders pull forward and down and his arms bend and pull into his sides. On reaching the ground with his toes he is not able to put down his heels and takes no weight but pushes himself backwards. Compare this with the way in which a normal child takes his weight when we 'bounce' him.

'Bouncing' a spastic child on his toes will aggravate the abnormal

postures and movements which we have just described. This will seriously retard the child's progress towards standing because, when on his toes and with a very narrow standing base, he cannot learn to balance or to separate his legs in order to transfer his weight from one leg to another to take a step.



*Figure 14.* Bouncing the normal child on the floor.



*Figure 15.* Bouncing the spastic child on the floor.





*Figure 16. Bouncing the athetoid on the floor.*

#### (c) THE ATHETOID CHILD

When lifted into the air—see Fig. 16, page 45—the athetoid child may straighten his legs but he does not usually turn them in nor cross them. When his feet touch the ground, he cannot support his weight and collapses or, if he throws back his head and shoulders, may stiffen and even cross his legs; he then stands for a moment on his toes and either collapses or moves his legs alternately up and down.

'Bouncing' the athetoid child will make him generally more stiff and increase his involuntary movements.

It must be pointed out that the use of 'Baby Bouncers' for cerebral palsied children has the same detrimental effect as bouncing the child on the floor, except in the case of very floppy children.

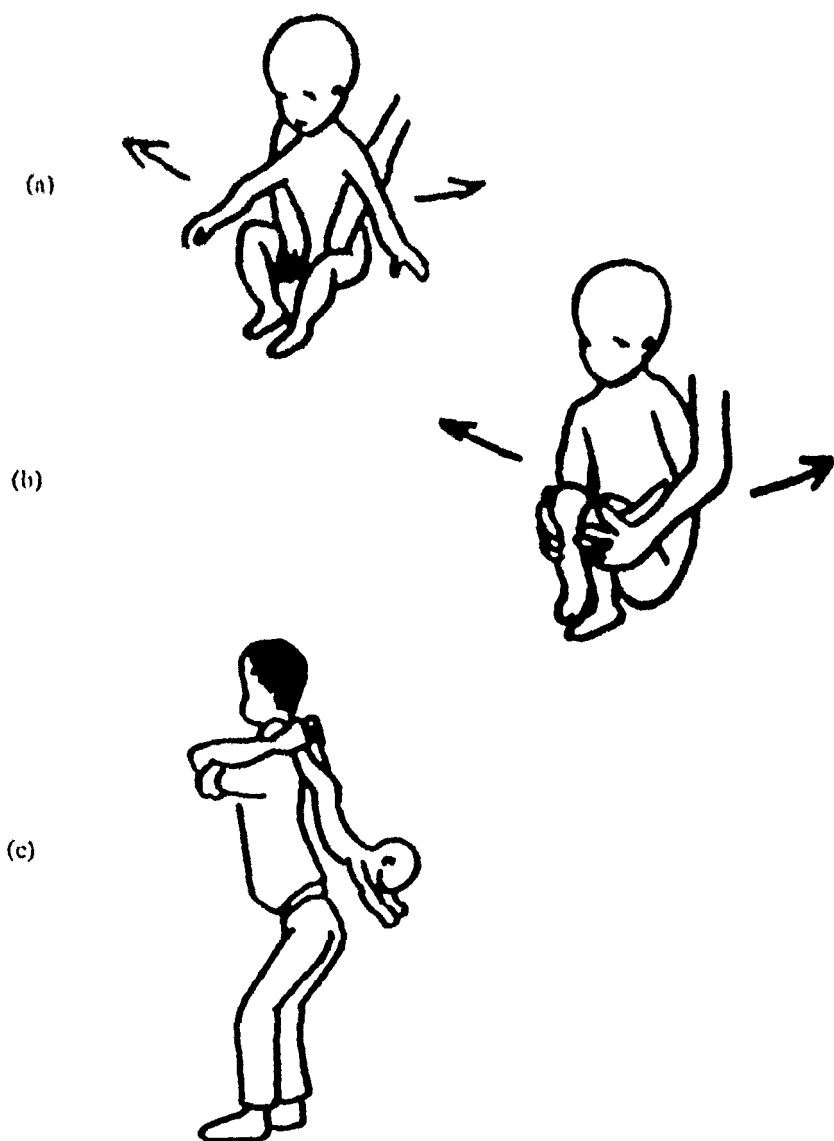
#### 'THROWING' IN THE AIR

For a normal child, throwing him in the air and catching him may be fun. All that we can say, speaking of the cerebral palsied child, is—do not do it—however much the child may appear to enjoy it. The excitement and stimulation will only make a spastic child very stiff and an athetoid even more disorganised in his movements. The child will enjoy himself just as much if you swing him slowly in the air, controlling him as illustrated in Figs. 17 (a) (b) (c), page 46.

#### Pulling up to sitting from lying on the back

##### (a) THE NORMAL CHILD

The child shown in Fig. 18, page 47, has reached the stage of being ready, with help, to assist in pulling himself up to a sitting position. You will see that he is symmetrical, his head is in mid-line to his



**Figure 17**

- (a) 'Swinging' a spastic child in the air. His legs are bent and turned out by the grip illustrated, your forearms will stop his shoulders pushing down and at the same time keep them forward. Keep his hips bent and pulled *towards* you, his back back forward and *away* from you.
- (b) 'Swinging' an athetoid child in the air. The position is similar to that of the spastic but the control is different. Bring the child's arms forward, your forearms *in front* of his arms, hold his hands over the lower part of his knees. The legs should be bent and held *together*. Keep his hips bent and pulled towards you, his back forward and *away* from you.
- (c) 'Swinging' a floppy child who has poor head control and a very inactive back. The legs are held at the ankles, the feet over your shoulders. By bumping him against your back, you will stimulate him to lift his head and extend his back and arms.

trunk and he has good head control. He reaches out to grasp one's hands and at the *same time* pulls himself up, lifting his head and shoulders off the pillow, bending at the hips, knees and ankles; a co-ordinated pattern of movement facilitating sitting up and the attainment of a good sitting position.



*Figure 18. Assisting the normal child to sit up from lying on his back.*



*Figure 19. Assisting the spastic diplegic child to sit up from lying on his back.*

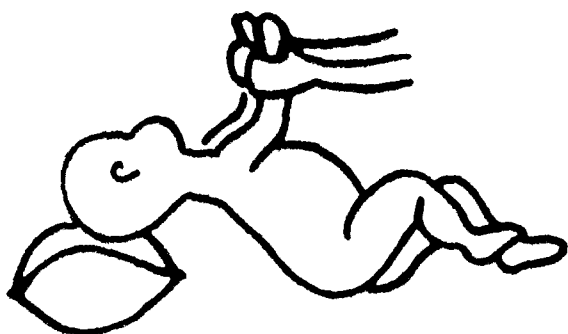
#### (b) THE SPASTIC CHILD

The child shown in Fig. 19, page 47, is a spastic diplegic (arms less affected than legs). As you will see from the illustration, although he is fairly symmetrical and has some head control, he is still not ready to help when one starts to pull him up into a sitting position. He is unable to reach sufficiently to grasp one's hands but he could manage to do so if he were allowed to keep his elbows bent. Now, if he were pulled up he would lift his head and arms forward on to his chest, but, at the same time, he would extend his hips and legs, turning his legs in and sometimes crossing them.

If the child were continually pulled up to sitting in this way, his spine would become more rounded, his arms more bent, and he would not be able to bend his hips and knees in order to sit up.

#### (c) THE ATHETOID CHILD

Fig. 20, page 48, shows an athetoid child (legs less affected than arms). The child is not symmetrical, has no head control, and no ability to grasp. If one were to try to pull him up to sitting, his head, shoulders and arms would pull backwards, the spine would extend and, at the same time, the hips and knees would bend.



*Figure 20. Assisting the athetoid child to sit up from lying on his back.*

Here, again, persistence would lead to the reinforcement of the abnormal patterns of movement. The child may learn to sit but only at the expense of excessive bending at the hips to compensate for the extension of the spine, head and arms. The child would not gain head control nor would he learn to grasp, hold on in order to pull himself up to sitting, or support himself when sitting.

It should be recognised that there is as positive a therapy in the avoidance of some movements as there is in the performance of others, provided that the reasons for avoiding them are clearly understood.

The movements which all parents are urged to discourage their children from doing are those which, if they are done in an abnormal way, will affect the ability to learn more advanced movements and those which may lead to deformities later. A few examples only have been given as the subject is one that will be dealt with fully during treatment, and parents will always be advised by the physiotherapist

which movements, if any—according to his particular difficulties—they should discourage their child from doing. What has been said will serve, however, to illustrate the importance of avoiding certain types of movement.

(a)



(b)



(c)



(d)



(e)



THE PRECEDING AND FOLLOWING SKETCHES AND ADVICE WILL SHOW THE CORRECT WAY IN WHICH TO HANDLE YOUR CHILD

An effective and economical use of your hands is probably the most important factor when managing the cerebral palsied child.

If you look at the sketches you will see how the position of the head and neck of the child determines the abnormal behaviour of his whole body.

We have illustrated some of the more typical reactions seen in the cerebral palsied child, but there are, of course, variations of these reactions found in each individual child.

You will realise when you look at these sketches how important it is to make sure that the child is symmetrical and that his head is in mid-line with his trunk when he is handled.

As the abnormal reaction 'patterns' of the whole body stem chiefly from the position of the head, neck and spine, it follows that we can control these abnormal 'patterns' most effectively from these points, known as 'key-points'.

The sketches, Figs. 21-43, pages 49-68, show how control at these 'key-points' influences the abnormal reactions of the child, and how handling at these points will make certain movements easier.

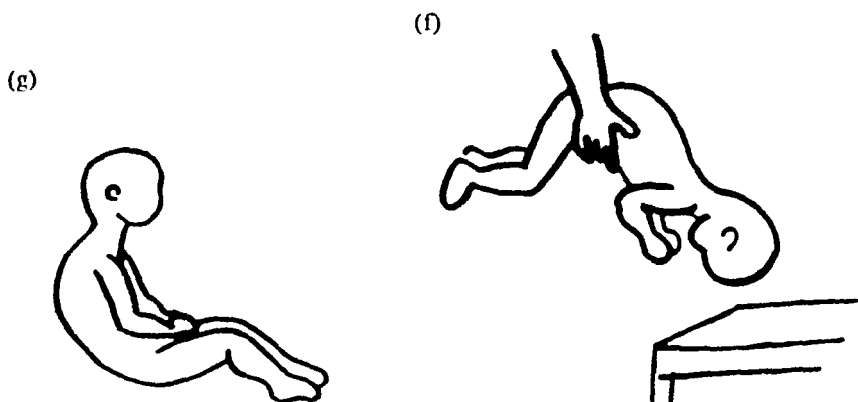


Figure 21—cont.

- (f) Bending of the head has the opposite effect, i.e. the arms bend and the hips and knees extend. This pattern can also be seen when the child sits.
- (g) Finally an example of a child with fairly good head control but otherwise moderate to severe spasticity. In this case he pokes his head forward to compensate for his difficulty in bending his hips and knees to sit.



(a)



(b)

*Figure 22*

- (a) Some cerebral palsied children push their heads back and at the same time bring their *shoulders up and forward*. Do not try to correct the position of the head by putting a hand on the back of the head, this will only cause the child to push back more.
- (b) Place your hands on each side of the head and push upwards giving the child a 'long neck'. As you do this push the shoulders down with your forearms



(a)

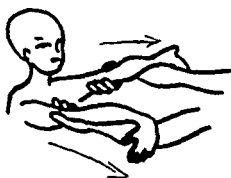


(b)



*Figure 24. Some children cannot raise or hold their head up in mid-line because they are generally too 'floppy'. By holding them firmly at the shoulder with your thumbs on their chest, you can give them some stability as you bring the shoulders forward; this will help them to raise their head up and hold it there.*





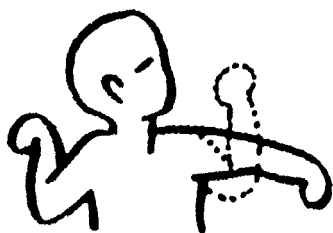


Figure 25—cont.

Group B

- (i) A typical pattern of extension seen in the *athetoid* child; the arms are turned *out* at the shoulders whether both are bent or one straight and one bent; this is generally accompanied by excessively bent hips.
- (ii) Hold the child over the outside of the elbows and bring the arms forward. As you straighten the arms turn them *in* at the shoulders.
- (iii) With *one* movement, the arms still turned *in* at the shoulders and slightly down, bring the child towards you and then gradually lift the arms up. By handling the child in this way you will facilitate the bending forward of his head, the rounding of his spine, and will modify the excessive bending at the hips.



(a)



(c)



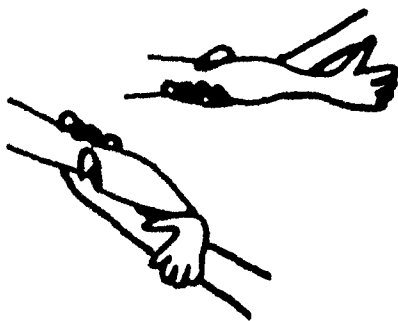
(b)

*Figure 26*

- (a) Shows the arm of a spastic child turned in at the shoulder (which presses down), the head also pulled to this side, the elbow bent, forearm turned in so that the hand faces down, wrist and fingers are bent, the thumb lying across the palm of the hand.
- (b) and (c) By lifting the arm, straightening and turning it out at the shoulder and elbow, it will then be found easier to straighten the wrist and open the fingers and thumb.



(a)



(b)

*Figure 27*

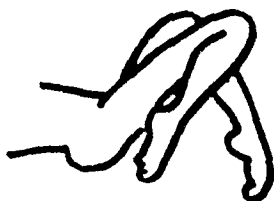
(a) Do not try to straighten the child's arm by holding above and below a joint. Trying to stretch a limb in this way will only make it bend more.

(b) By holding your hand *over* the joint you can straighten and turn the limb in or out in one movement.



(a)

(c)

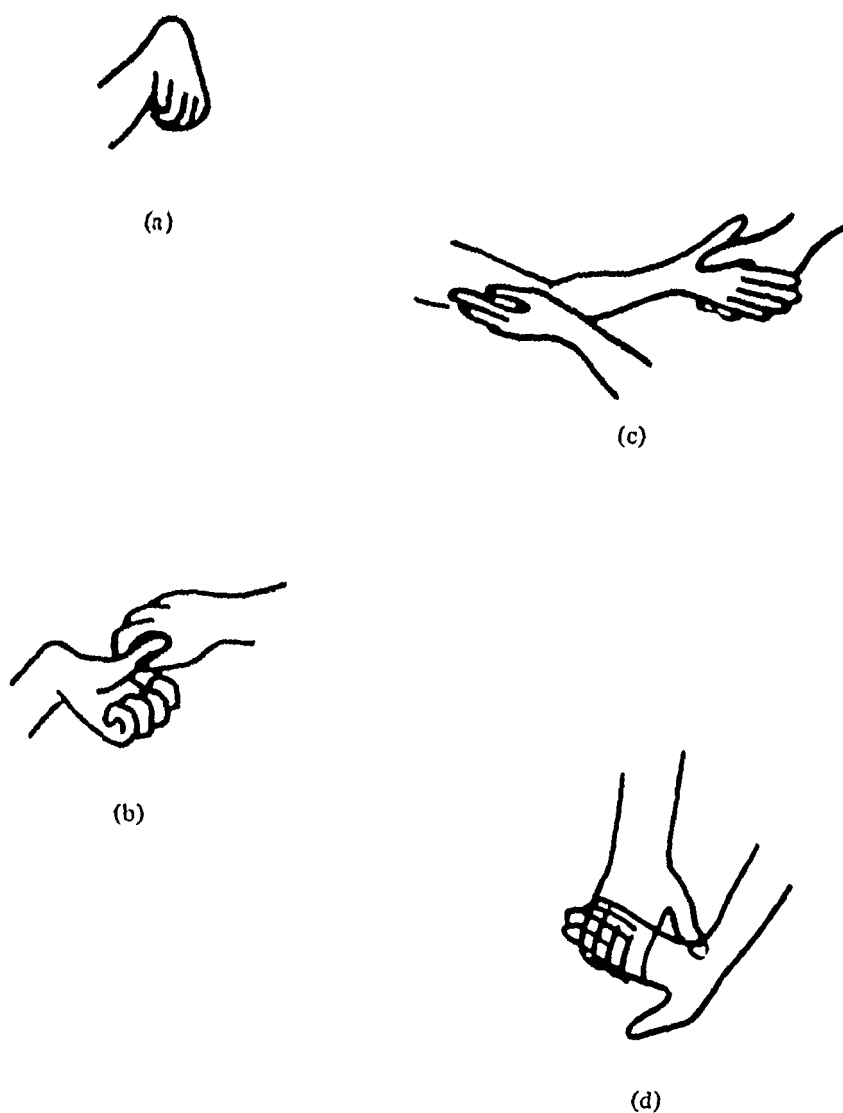


(b)

*Figure 28*

(a) and (b) Typical positions of the severely spastic child. If we try to bend the foot while the legs are in this position, for example to put the child's shoes or socks on, it will be found to be impossible.

(c) If the hips are bent and the legs parted it will be found that this position will facilitate the bending of the foot.



*Figure 31*

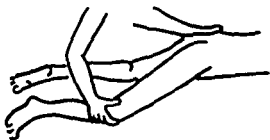
- (a) Typical hand of a spastic child, hand clenched with bent wrist, thumb held across palm of hand.
- (b) Incorrect way to straighten wrist and fingers—by pulling on the thumb in this way, the wrist and fingers bend more; there is also danger of damaging the thumb joint.
- (c) By first straightening and turning out the arm it is then much easier to straighten the fingers and thumb.
- (d) Correct grasp to hold the fingers and wrist straight.

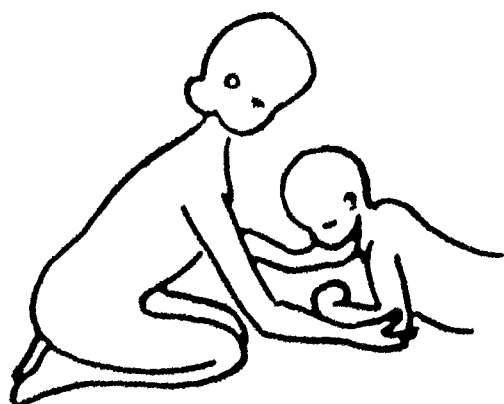


(a)



(b)





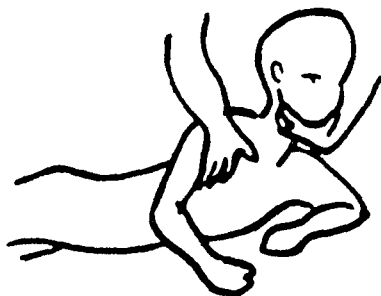
(a)



(b)



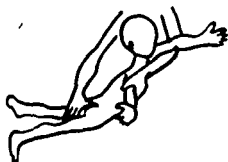
(c)



(d)

*Figure 33. The correct way to control the child so that you can put him flat on his tummy.*

- (a) At the same time as you lift and turn the head, start to bring the arm forward.
- (b) Turn the shoulder out as you lift and straighten the arm—your point of control is over the elbow joint.
- (c) Holding the head up, keep the arm straight and in the air, as illustrated, until it no longer feels heavy and does not press down at the shoulder and then place the arm on the floor. Follow the same procedure with the other arm. Do not let the head bend forward.
- (d) If the arms are not too stiff, lifting the shoulder up and out with rotation of the trunk may be sufficient to facilitate the bringing forward of the arm.



(a)



(b)

*Figure 34*

(a) When placing a child over a roller do not put him on the roller *before* you have got him straight as illustrated, This will minimise his difficulties when he lies over the roller.

When the child tries to take weight on his hands or play in this position, the tendency will be for his hips and legs to bend.

(b) This sketch illustrates how by controlling the child by holding him at the hip joints you can keep his hips straight also his legs and at the same time turn them out.



*Figure 35.* The normal sitting position, the hips are bent, the back and head in alignment, the knees are bent, the feet flat on the floor.





*Figure 36.* One of the many sitting positions of a young normal child. Note the wide base and erect spine.



*Figure 37.* The following are the reasons we do not encourage cross-legged sitting:

1. Because of the bending of all joints there is a danger later of hip and knee flexor contractures developing making it very difficult or impossible to stand the child later on.
2. It is an asymmetrical position.
3. There is too much weight on the outside of the feet which are turned *in*—a position of the foot that will develop later anyway in many cerebral palsied children when they start to stand and walk, we must try not to reinforce this tendency.



(a)



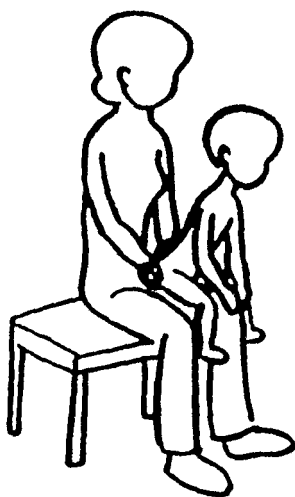
(b)



(a)



(b)



(c)

*Figure 39*

- (a) Floppy child sitting, unable to raise his head and straighten his back.  
 (b) By placing both hands firmly (pushing down) over lumbar region (lower back) thumbs either side of spine will give the child a point of fixation and facilitate the raising of his head and straightening of his spine.  
 (c) This can also be done as the child sits on your lap.



(a)



(b)



(c)



(a)



(b)

*Figure 41*

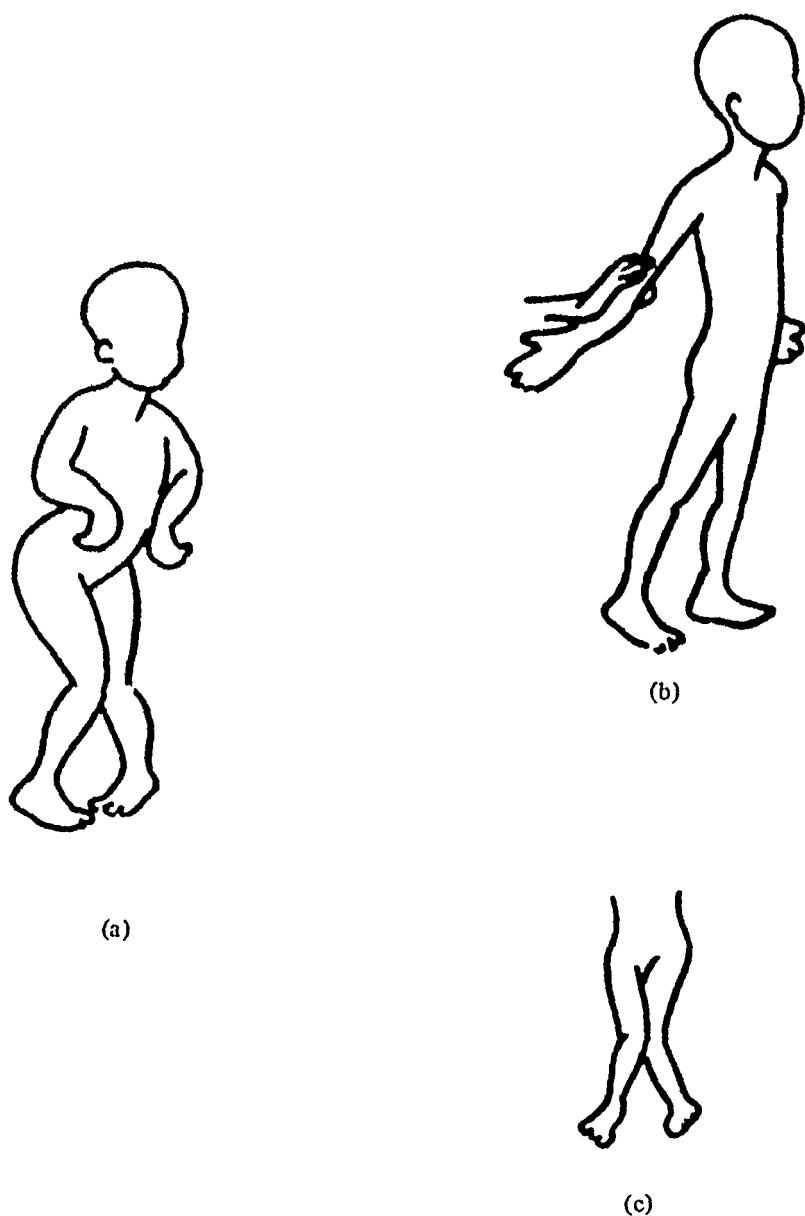
- (a) Typical sitting position of the athetoid child, hips very bent with legs straight and wide apart, at the same time his head and shoulders are pulled back; this makes it impossible for him to use his arms for support or to reach forward to use his hands.
- (b) The child sits with his legs bent and together, he is held at the shoulders which are turned in and brought forward, steady pressure is given. This will prepare him for the next stage, i.e. having his hands at his side and supporting himself. The same hold at the shoulders should be used.



(a)



(b)



*Figure 43*

- (a) Typical standing position of a spastic child. The abnormal pattern of his legs give him only a small standing base (see also fig. (c)), his weight is taken on the toes or inner edge of the foot; this makes it impossible for him to transfer his weight sideways on to one leg to enable him to take a step forward.
- (b) To help this child to walk, straighten and turn out the arms held at the elbows, pushing the shoulders up and forward. This will help to straighten and part the legs and straighten the head, spine and hips.

## CARRYING

Great care must be taken when picking up and carrying the cerebral palsied child. The child should be in a good position before being lifted and given adequate support where necessary. Extra care should be taken when lifting the child who has little or no head control, remembering that good handling of the shoulder girdle and arms makes it easier to control his head, as described in chapter 2.

The first and most important point to remember is to sit the child up symmetrically before lifting him, bending him well forwards at the hips. As we have already pointed out, many cerebral palsied children when lying on their backs have very stiff hips. If you feel resistance when bending his hips, try to bring the head and shoulders forward at the same time as you bend his hips; or, with the heavier and older child, roll him on to his side where it will be found easier to bend the head and shoulders forward and so facilitate the bending of the hips. Fig. 44, page 70, shows the incorrect way of lifting the child and the difficulties that may arise. Figs. 45 (a)-(f) pages 71-72, show the correct way of handling the child preparatory to lifting him, making it easier both to lift and to hold him as you adjust his position for carrying.

See also that he is in a sitting position when you are putting him down.

Far too many children, long after they are babies, are carried as shown in Figs. 46 (a) and (b), page 72. Not only is this bad for the child emotionally, but it does not give him a chance, if supported in this way, to do anything for himself. It also robs him of the opportunity of seeing what is going on around him. Figs. 47 (a), (b), (c), page 73, illustrate a way of holding the child with a good base for carrying, and show how support can gradually be reduced. If held in this way it will be seen, firstly, that the child is able to put his arms around his mother's neck, provided he has the ability to grasp, and, secondly, he is able to make use of what ability he has to balance. This position also enables him to look around while he is being carried (see also Fig. 48, page 74).

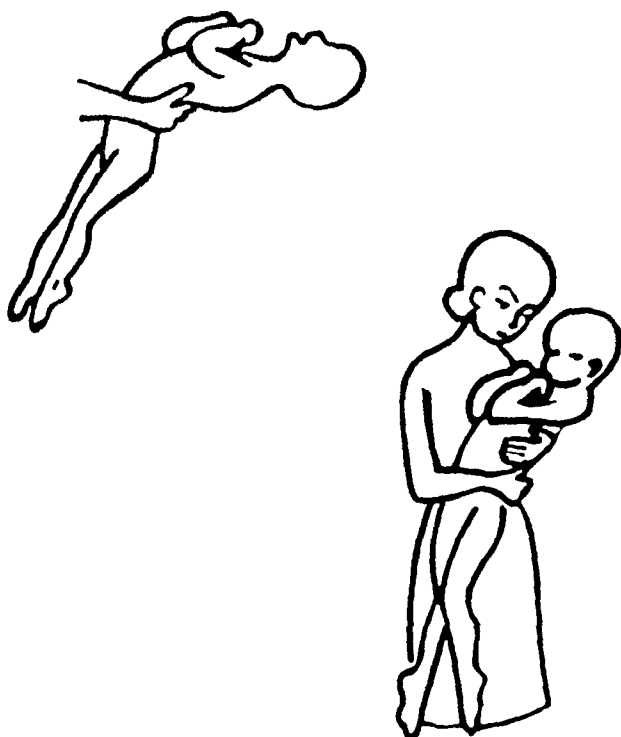
Fig. 49 (a), page 74, shows how a normal child is carried. It will be seen that the outside leg is always bent. In the cerebral palsied child, one leg is always more apt to bend than the other, especially if the head is turned predominantly to one side, as we have already described. Ideally,



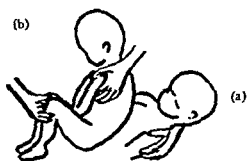
then, his mother should just change him over to her other side, i.e. where the right leg is more apt to bend he should be held on the left side of his mother. In practice, this is not always possible as most of us are either predominantly right-handed or left-handed. Fig. 49 (b), page 74, shows how this difficulty can be overcome. Figs. 50 (a) and (b), page 75, illustrate methods for carrying spastic, athetoid or floppy children, showing the important points of control. Figs. 51 (a) and (b), page 75, illustrate how the heavier cerebral palsied child is frequently carried and the correct way of carrying him.

In our experience, although many children have to be carried about because they cannot walk, these children still sit on their parents' laps, despite the fact that they have sitting balance and could sit on a chair or on a stool.

Carrying the child should be kept to a minimum; this applies especially when at home (see Figs. 52 (a) and (b)).



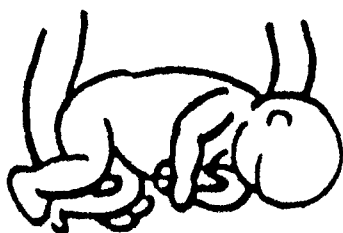
*Figure 44. Incorrect way to lift a spastic child whilst he is lying flat on his back, making it harder to bend his hips, bend and open his legs and to bring his arms forward to place on your shoulders.*



(c)



(f)



*Figure 45—cont.*

- (c) An athetoid child lying on his back, the legs and hips are bent but the head, shoulders and arms press back, the spine is often stiff. Lift him by placing your arms under his arms, your hands on his body as illustrated. By pressing your hands gently in and at the same time pushing with your forearms, his head and arms will come forward.
- (f) If the child has this pattern of head, trunk and arms and also very stiff straight hips, control him in the same way as in fig. (a), at the same time turn him on his side before you lift him and you will find it easier to bend his hips and legs.

(a)



(b)



*Figure 46*

- (a) A child carried as a baby, completely supported and unable to look around.
- (b) Note when carrying the child in this way the tendency is to pull him towards you, especially at the hips. As explained in Chapter 2, page 49, this is an abnormal position and similar to that which the child adopts when lying on his back.

(a)



(b)

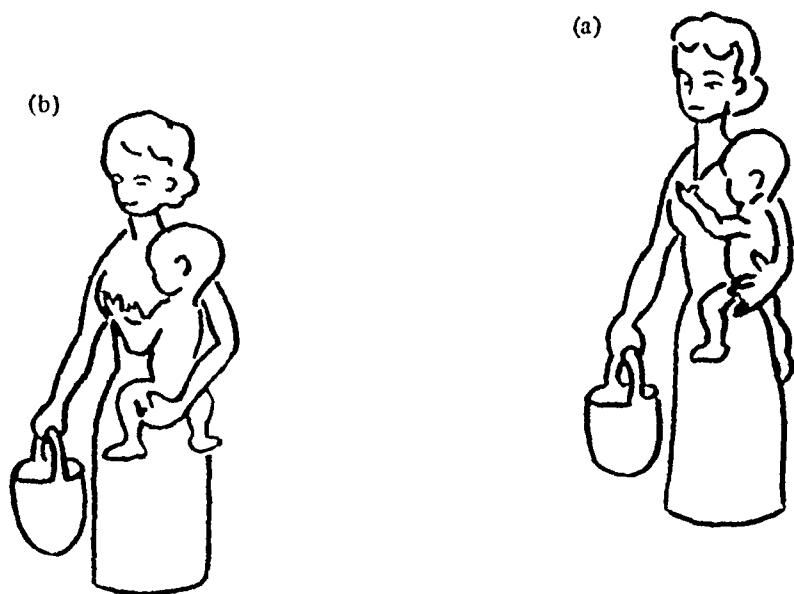


(c)





*Figure 48. A rather primitive but nevertheless effective way of carrying a severely affected child, giving him complete support and leaving your arms free.*



*Figure 49*

- (a) The normal child being carried by his mother bends his left leg (the outside leg) and straightens the other.
- (b) If a spastic child tends to adopt this pattern of the legs in all positions, instead of changing him to the other arm, bring him forward and in this way you will be able to bend and part both his legs.

(a)



(b)



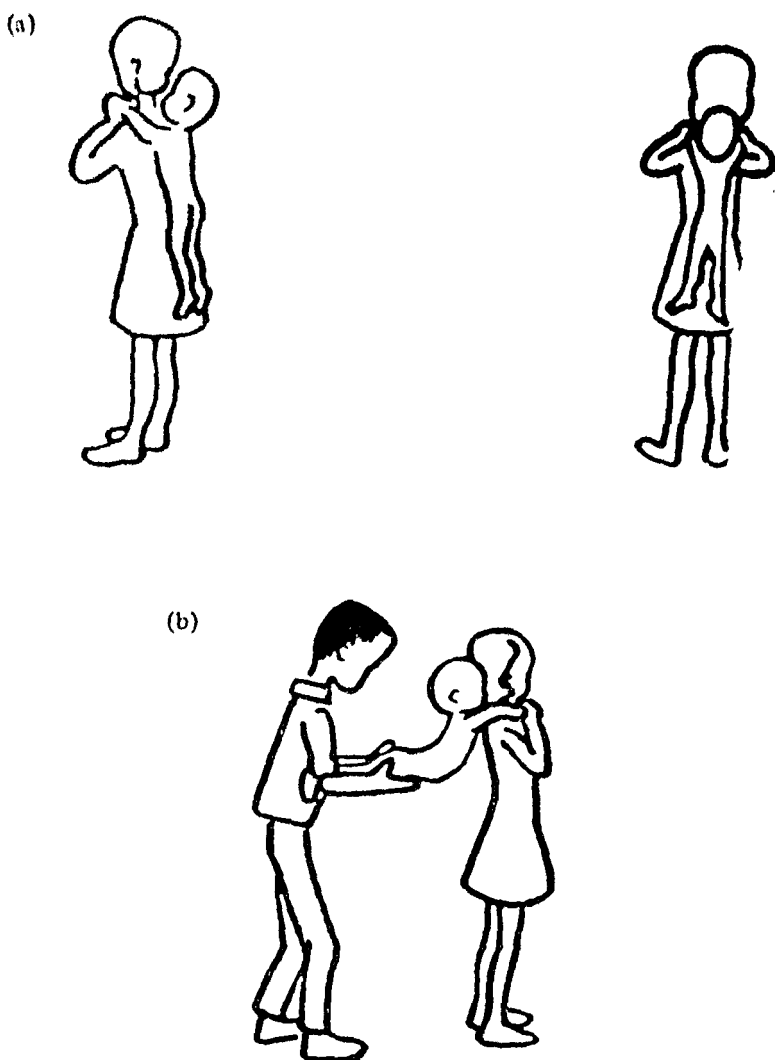
chapter 2).

(a)



(b)





*Figure 52*

- (a) The spastic child who in all positions has his head pulled on to his chest, arms bent, spine rounded, often has difficulty in extending his hips. The 'position' of carrying reinforces all these difficulties—avoid carrying whenever possible. When he is at home, try holding him as illustrated, this will help him extend his hips, stimulating his back and head to extend.
- (b) Same type of child as illustrated in fig. (a) carried by both parents, fun for the child and at the same time good for treatment. The legs are held apart and out at the hips, the feet flat against your body. When the hips are really straight and the child has no spasm push up with your thumbs from the bottom of the buttocks, stimulating the back and head to extend actively.

## BATHING

*Bathing the cerebral palsied child is never simple. While few difficulties may arise when the child is small, they become more apparent as he grows older. The severely handicapped child will be unable to sit in the bath or to use his hands to hold on for support; others may have an ability to sit but, having insufficient balance, will have to rely on their hands for support all the time.*

In order to realise the importance of balance, consider yourself when having a bath. You will notice how much balance is required when lifting your legs to wash your feet, or the complicated movements necessary for washing your back. This will give you some idea of the difficulties your child will have in trying to keep his balance.

Here are some suggestions that may make bathing the child easier.

With the younger child the care with which you handle him before you put him in the bath is most important. The methods described in Chapter 3, dealing with picking up and carrying, may prove to be a useful guide.

Some babies and young children have a 'startle reaction'; arms shoot out and up and the hands open, this happens if the child is tilted backwards. Reinforcement of this 'startle reaction' makes sitting and balance in any position impossible, and prevents the child from holding on or supporting himself on his arms, and must therefore be avoided.

The effects of this reaction can be reduced to some extent by sitting the child in a good position with his head and arms forward before attempting to lift him into his bath. See Fig. 53, page 77. Maintain this





position while lowering him into the bath, rather than putting him in a half-lying position, as the difficulty of correcting this position when he is wet will obviously be greater. With a very young baby who has a strong 'startle reaction', washing him is simpler as shown in Fig. 54, page 78.

Before starting to wash the child, be sure that he is sitting in a symmetrical position, his head in mid-line, arms both forward and his weight equally on both buttocks.

The difficulties in lifting the child out of the bath are of course greater than when putting him in, as then he is wet and slippery; control will be easier if the child is bent well forward from the hips, and if he is wrapped in a towel before you lift him. This is possible by first letting the water out.



*Figure 54. A simple way of holding a young baby to wash who is very extended or has a 'startle reaction'.*

If the child is to feel safe and to enjoy bath-time, he must be handled slowly and be able to adjust himself while you move and wash him; as he grows older the best way to do this is to tell him what you are going to do. Start off by touching and naming the taps, explaining that one is for hot water, the other for cold; show him how you turn the water on and off and demonstrate the difference in the sound between a heavy or light flow of water; show him the plug and explain how it works. Let him see you test the temperature of the water. In this way you can make a game of bath-times and will find it much easier to secure his co-operation.

When he is in the bath let him feel the difference between a dry, wet, or soapy sponge; try to relate the way you are bathing him to the way he should bath his toys; let him try to copy you. Have floating toys in the bath; very often the cerebral palsied child can manage to play more easily with floating toys as he can move them around without undue effort. A length of polythene tubing now sold to play with in the bath will provide fun for the child.

Before starting to teach him to wash himself, it is worth while to play with him as suggested in Chapter 11, page 191.

As the child grows and you have to start bathing him in a normal size bath, the problems of handling become greater. Whereas the baby bath can be placed at a convenient height for you to manage, a normal sized bath is deep and awkward in shape. When the child starts getting too heavy for you, try to lessen the strain on your back by sitting on a stool or kneeling on a cushion. Steadying yourself in this way you will be able to lift the child more easily.

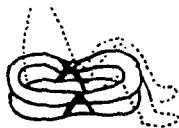


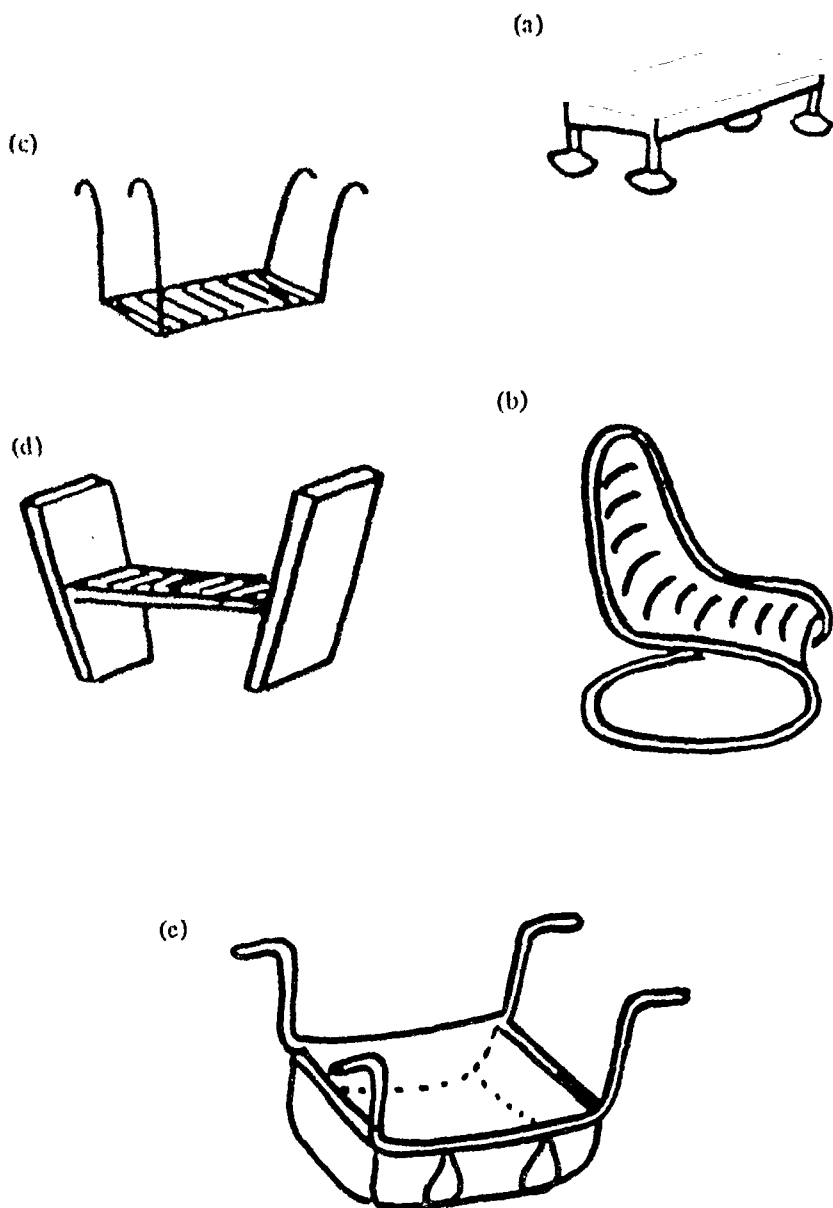
Figure 55. Two rubber rings tied together provide support for the child's back, and help him to remain in a sitting position.

Some parents at this 'in between stage' bathe their child either in a deep sink, so that the child can sit on the draining board, or place the baby bath in an adult size bath.

If the child is to feel secure, the first thing we must do is to see that the bath has a non-slip surface. In the baby bath a turkish towelling nappy is perfectly adequate, in the normal size bath a rubber mat with suction cups underneath is best. These are reasonable in price and can be purchased in any large store or chemist. Some small children feel happier if, in addition to a rubber mat, they sit inside two rubber rings as shown in Fig. 55, page 79.

Normally a bath is so shaped that the only way one can sit in it is with the legs straight out. As this is the easiest way for an athetoid to sit, his problems are not so great as are those of the spastic. When the spastic child tries to sit with his legs out in front of him, he finds it impossible to bend his hips or to straighten and part his legs and therefore loses his balance. Figs. 56 (a)-(e), page 80, show various types of seats that can be used in the bath for the spastic child and which will enable him to bend at the hips and knees and make it possible for him to sit. We have not used a roller in the bath, but where flat seats are not the answer this could be tried, placing the roller lengthwise.

When deciding which type of seat would be best for your child, make sure that it is of the correct width and height. The bath seat as sketched in Fig. 56 (e), page 80, recently designed by the father of a



*Figure 56. Various types of seats that can be bought or made for use in the bath.*  
 (a) Simple stool with suction cups on the legs, seat covered with terry-towelling or rubber.  
 (b) Seat for the bath with terry-towelling, more commonly used in the United States.  
 (c) Bath seat that can be bought at most large stores.  
 (d) Two pieces of wood, which are slotted to allow for height adjustment, and fit inside the bath thus forming a seat which is covered in rubber.  
 (e) 'Safa'-Bath seat. We have had excellent reports of this bath from parents.

handicapped child, and now on the market, has been found satisfactory by many parents: it is called 'Safa-Bath'.

An older child, who has started to bath himself but who has not yet reached the stage of being able to step over the edge of the bath, can be given a box, stool or table of the right height on which he can stand or sit before stepping in. Make sure that he has something on which to hold: bars for this purpose can be obtained at most stores. See sketches, Fig. 57 (a) and (b), page 81.

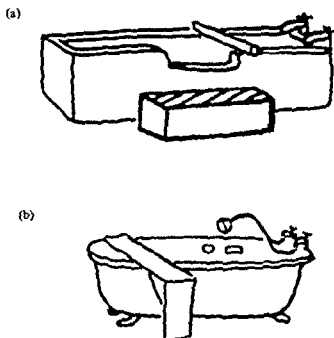


Figure 57 Various ways of making it easier for child to get in and out of the bath and to manage on his own.

When bathing the severely handicapped child, use very little water so that he can be washed lying down. If he has some degree of head control, one of the suction cushions made for the bath, against which he can rest his head, is useful. Webbing, as sketched in Fig. 58, page 82, will help the more severely affected athetoid child to sit in the bath.

The latest 'Naiad' bath on the market is made of Perspex and is non-slip. The bottom is flat and square, with the middle of the panel of the bath lower than the two sides: see Fig 58, page 82, simplifying getting in and out. Mothers who have tried this type of bath have reported favourably on it.



*Figure 58.* Webbing that may help the athetoid child to sit in the bath. A similar attachment can be used on the wash basin.

The following items of bathroom equipment may help the child when he reaches the stage of bathing himself:

- A glove or mitt-type flannel;

- A mitt-type loofah;

- A wooden nail brush with dented sides which makes it easier to grip, or a piece of webbing over the top of the brush through which the hand can be slipped;

- A long handled back brush;

- A liquid soap container;

- Soap and nail brush with suction caps to be placed against the bath or on a bath tray;

- Hand spray attached to taps for rinsing if a fixed spray is not a permanent attachment;

- A large bath towel with a hole in the middle which can be slipped over the head, a terry-towelling wrap, or a towel with a tape on it which can be tied to the wall.

## TOILET-TRAINING

It is easy to become over anxious when trying to 'toilet train' the cerebral palsied child. One of the mistakes most often made is to try to train too early, resulting in over-anxiety at apparent failure.

The bladder of a new born baby is easily stimulated and is not under the child's control. In fact, some cerebral palsied children continue to suffer from this type of 'baby bladder' for an extended period, and training during this period will have little or no effect.

The normal child, until he is about one year old, does not associate his pot with its functions. At about the age of one year he begins to have some idea of the purpose of 'potting', and starts to indicate his needs by gesture. Gradually he begins to talk and learns to ask for his pot. When he starts to walk, he becomes so absorbed in what he is doing that again he often makes his needs known too late. Nevertheless he is gradually improving, and eventually reaches the stage, around two years of age, when he is partially toilet trained and can manage to restrain himself until he has finished playing or whatever else he is doing. Generally at this moment one sees him wriggling and jumping about. He will be about four years of age before he starts to take himself to the lavatory.

The process of toilet training is a gradual one, and can be easily upset by emotional stress, excitement, new surroundings, and during the first few days of school. The time taken to train normal children varies considerably, and is by no means easy.

Very often a mother will find that, having as she thought, succeeded in the toilet-training of her child, he reverts to earlier habits. She is then faced with the need to commence training again, a process in which a great deal of time and patience is essential. If it is so difficult to toilet train a normal child, how much more so is it in the case of the cerebral palsied child.

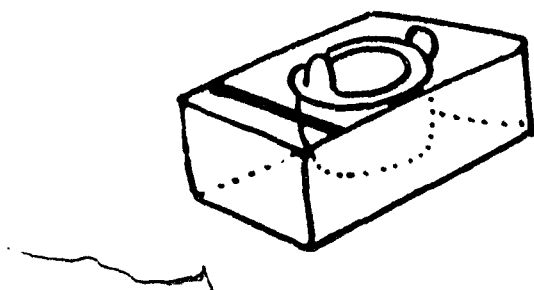
The best way of tackling the problem of toilet training is to 'pot' your child every hour when he is at home, even though he may no longer be a baby, thus establishing a regular routine instead of at odd intervals. Only frequent and regular potting will lead to success. Tell him why you are going to put him on his pot, and what you expect him to do, he must develop a wish to please you otherwise he will see no reason why he should not continue to soil his nappies. When he learns to under-

stand but starts to cry because he wants to get off, be firm. Lengthen the time gradually that he sits on his pot and give him a toy as you would a normal young baby, but be sure he understands he is there for a specific purpose. There is always the danger of the cerebral palsied child being distracted if you give him toys, so as soon as he reaches the stage when he should be toilet trained do not give him anything that will prevent him from concentrating on what he is doing.

The greatest difficulty often found is the child's inability to sit and to relax, or to be in a position in which to be able to press down for emptying his bowels, making release possible. For this reason the correct type of pot and its position is important, as also is the position of the child on the pot.

A boy's pot, with raised sides and something on which to hold in front, is most satisfactory and will give the child added security, helping him to overcome his fear of falling.

A clear plastic is a good material and avoids the necessity of lifting the child to see if he has finished. A small strip of foam rubber around the rim gives a firmer base for sitting.



*Figure 59. Pot fitting into a cardboard box. Bar to hold on to.*

As to the position of the pot, if this is placed on your knees the younger child will be more relaxed, and you can support him, which is essential if he has poor head control and no trunk balance. You can also hold his legs apart.

We have found that, as the child's balance improves, it is useful to place the pot in a cardboard or wooden box. Fig. 59, page 84, Later the corner of the room or a triangle chair, without the upright bar can be used, always with a stool, chair or box in front so that he can hold on, or at least have his arms forward. The 'potty chair' when needed must be chosen to enable the child to sit as relaxed as possible, and he should still have a stool or chair in front of him. It is better, however, whenever possible, to make adaptations to the lavatory (see Fig. 60, page 85).

Lavatory seats. The ordinary 'Kiddicraft' seat can be used for small children, followed, when necessary, by toilet seats made especially for handicapped children. Two stools or boxes, one under each foot, will help, not only to give security, but also to allow the tummy muscles to relax. Fig. 61, page 85, shows a simple way of making an adaptation to the lavatory.

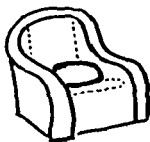
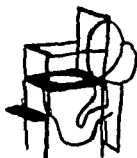


Figure 60. Example of a good 'potty chair'. Solid base, untippable. If the child's feet do not reach the floor, a *slim* wooden box should be put under the feet.





## General points to bear in mind in toilet training

As the skin of cerebral palsied children is often very sensitive we recommend, to prevent chafing, any of the many nappy liners on the market, or the use of pads of soft cellular cotton inside the nappy.

If, by the time your child is three or four years of age, he is still not toilet trained despite the fact that he knows he should ask for his pot, take him out of nappies; this will make him feel more uncomfortable and more inclined to ask for his pot. See, of course, that at that time he is dressed in easily washable clothes.

Cerebral palsied children often suffer from constipation. Take care that this condition does not become chronic and, if necessary, consult your doctor. Putting the child in a squatting position, or on his back with his knees against his tummy, for a period of time, may help him.

Boys take longer to train than girls. Both will be dry and clean during the day before training is successful during the night.

Bowel control is normally achieved before bladder control, as it is easier for the mother to 'catch' him.

Do not start using a bottle for a boy unless his handicap is so severe that it is impossible for him to sit: use of a bottle is far too abnormal for everyday life.

A child will not be able to sit alone on his pot or on the lavatory seat until he has head and trunk balance and can sit with his hips and knees bent and apart with his feet flat on the floor; he also needs the ability to bring his arms forward to hold on to a support.

The height of the lavatory will obviously make the child more insecure. Always see that his feet are supported, and if he has to rely on his hands to help him to balance, that he has something within reach on to which to hold.

## DRESSING

**A general guide to the normal developmental stages that lead to the child's ability to dress and undress himself**

- (a) A normal child starts to co-operate with his dressing at about twelve months. He begins by holding out his foot for his shoe, or an arm for a sleeve.
- (b) At about eighteen months, at the same time as he achieves unsupported sitting, he does not have to rely on his hands for support and he deliberately pulls off his socks, shoes and hat. Previously he may have snatched them off, but unintentionally.
- (c) Between eighteen months and two years he will co-operate more and more, starting to help to undress himself at about two years of age. He first starts to take off his clothes, and, gradually, as his hand movements become more co-ordinated, he begins to be able to put clothes on.
- (d) Between four and five he can dress and undress except for buttons, ties and laces, and enjoys doing so; he attempts to lace his shoes but without appreciating whether or not the laces are in the correct holes. During this period he learns a lot by copying the way his mother does things and by experimenting with his own clothes or with those belonging to anyone else that he can find.

In dressing, as in all functional activities, the aim from the very beginning is to work towards maximum independence within the child's capabilities. The first stage in this programme is to gain the child's interest in what is being done, and, as his abilities develop, to try to gain his co-operation.

It has to be remembered that a normal child is about twelve months of age before he begins to co-operate in a very simple way with his dressing, and at least five or more years before he is completely independent. It takes him all this time before he can master the rather complicated movements required to put on and take off his clothes and to have sufficient balance to do this safely without falling over. A child of three-and-a-half should be able to lace the holes of his shoes, but until he is five or more will not be able to appreciate which holes to lace and in which direction. Similarly a child may push his feet into his shoes at

three-and-a-half to four but it does not become apparent to him which shoe goes on which foot until some time later. In fact the apparently simple activity of putting on and taking off one's clothes is far more complicated than is generally realised and follows a definite pattern of development although with individual variations.

### Dressing and undressing a cerebral palsied child

When a spastic child reaches the age of about eight or nine months, or earlier in some cases, one may begin to feel resistance to certain movements as he is dressed and undressed; his legs may be difficult to part to put on his nappy; his arms difficult to straighten to pull them through his sleeves, and so on.

The athetoid baby does not present the same difficulties as the spastic baby. The mother may find that her child kicks persistently but at this stage she can still manage to dress him while he is lying down. As he gets bigger and she tries to dress him when sitting up, however, she will find him much harder to handle due to his lack of head and trunk control and, in some cases, to extensor spasticity which may have developed.

It is never a good idea to generalise in these cases, but most cerebral palsied children stiffen up and become more difficult to handle when they are lying on their backs than when they are in any other position. This becomes more obvious as they grow older and athetosis and spasticity become stronger. Most children have a tendency, when in this position, to push the head and shoulders back, straightening and stiffening hips and also the legs, which they often cross.

In order to gain the child's interest, he must first understand that he is going to be dressed and undressed, and what is being done and why. This is difficult if he is lying on his back and cannot see properly what is going on. If he is constantly dressed and undressed as if he were a doll, he cannot be blamed if he becomes quite detached and passive, showing no interest. Aim at dressing and undressing him as soon as possible in side-lying, or, preferably, sitting up, when he will be easier to manage and will have much more chance to see for himself what is going on and be stimulated to help whenever he can.

When a child is severely handicapped and is becoming heavier to handle, lying on his back is often the only way possible in which to dress and undress him. If one first puts a hard pillow under his head, seeing that his shoulders are also raised a little, one will find it easier to bring his arms forward and to bend his hips and legs.

### Lying on either side

With some garments it is not always practicable to dress your child while he is lying on his side, but it is suggested as an alternative because many mothers, to our knowledge, have found this a useful position as the child is not so stiff. If you have difficulty in dressing your child and are unable to do so in a sitting position, you should give this method a trial.

The following advantages have been found:

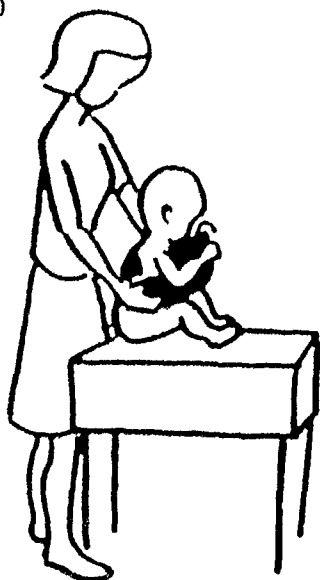
- (i) By rolling the child from side to side, both before and as you dress him, he is not in any one position for long, does not therefore become so stiff and is easier to handle.
- (ii) There is not so much tendency for the child to push himself back when he is on his side, and the shoulders and head are easier to bring forward. It is, therefore, easier to put clothes over the head and around the shoulders, and if there should be fasteners down the back, it is easier to reach them.
- (iii) With the shoulder forward there will be less resistance to bringing the arm forward and to straightening the elbow, when, for example, putting his arms through his sleeves.
- (iv) In many cases the child's legs and feet bend more easily in this position, and pants, socks and shoes can be put on with less of a struggle.
- (v) Being less stiff on his side and with the improved head and eye-hand control which this position promotes, the child has a chance to see what is going on. He can start to co-operate and help with his dressing.
- (vi) In certain cases mothers with babies who have very stiff legs have told us that they find *side-lying* an easier position to part the legs of the baby when putting on his nappy.

### Sitting on your lap

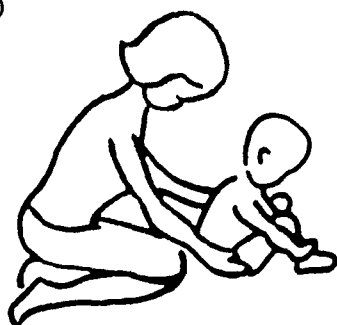
It is most important to see that you have provided your child with an even, safe base on which to sit. If he is leaning backwards he will tend to fall back. If he takes his weight on one buttock only, his balance will become precarious and he may fall to one side, and you will start at a disadvantage when you try to dress him. In many cases, the struggle one sometimes has to get a child's arm through his sleeve could have been avoided if it had been noticed that the child has slipped back on his seat while being dressed, for it is very difficult to bring the arms forward while the trunk and shoulders remain back and the hips extended. A cerebral palsied child who cannot sit and maintain his balance unsupported

is easier to dress if he sits with his back to you leaning well forward (see Figs. 62 (a) and (b), page 90). In this position you can keep his legs apart and his hips bent. It is also an ideal position for the child who is inclined to straighten his hips and to fall back when one lifts his arms up or tries to bend his legs, especially when putting anything over his head.

(a)



(b)



*Figure 62.* By controlling the child from the back whether on the floor, or on a table or a stool, you can keep his hips bent and his trunk well forward. In this way, lifting his head, lifting and bringing his arms forward, or lifting and bending his hips and legs will not immediately upset his balance. He is in a good position to see what you are doing and later to start co-operating with his dressing—and his hands will be in the same position as yours when he starts to dress himself.

When your child grows heavier and older, Fig. 63, page 91, shows a position in which handling may be easier and which makes it possible for him to co-operate. When dressing or undressing a more severely handicapped child, sit in front of a mirror so that he can see what you are doing.



*Figure 63.* Dressing the older heavier child. It is more satisfactory if you can sit on a stool that will enable the child to have his feet flat on the floor.

(a)



(b)



(c)



## **Suggestions for handling in dressing when the child starts to co-operate and finally takes over for himself**

It is most important that your child should be as independent as possible by the time he reaches the age to go to nursery school or, later on, to school. You should therefore try to gain his help and interest at an early age, for the longer he is dressed and undressed by you the less inclined he will be to try for himself.

Your child should be ready to start to dress and undress himself when he has sufficient balance to enable him to sit leaning forward freely and to reach out with straight arms and grasp, relying only occasionally on one arm for balance. The co-ordination and manipulative ability necessary to enable him to use his hands for dressing is described under chapter 11, 'The link between functional activities and play'. There are some children who, though quite severely handicapped and have no sitting balance, nevertheless, have good hand control; these children can often start to dress and undress themselves when lying on their backs or side. See Figs. 64 (a), (b), (c), page 91, for various positions and suggestions which will help such children to reach a degree of independence in dressing.

We pointed out in Chapter 1, how important it is to talk to the child while he is being handled, even though one may often have to answer as well as to ask the questions put to him. We have only to watch a normal baby being dressed and undressed to realise how a mother chatters spontaneously to him and how, even before he can talk, he babbles in response. Many cerebral palsied children are unable to respond even in this way and in time it is easy for a mother not to bother to talk to her child and to dress him in silence.

A normal child also has the advantage of being able to ask questions when he is puzzled; to learn by trial and error; to make use of and build up on previous experiences, and to ask for help immediately he requires it. Yet it still takes about five years before he is almost independent. One can appreciate that the cerebral palsied child, with his many and varying difficulties, cannot be proficient in his dressing and undressing unless he is helped in all his problems.

As we dress the cerebral palsied child we can help him to get to know and feel the various parts of his body, naming them as we do so. We can explain that his socks go on his feet and why; that his jersey goes over his head, and so on. We can point out the various openings in his clothes, relating clothes to the parts of the body: for example, the head through the neck opening; the arms through the sleeves. We can help him to relate such phrases as '*push* your foot into your shoe', '*pull* your arm out of your sleeve', as we perform the movement and, if he is beginning

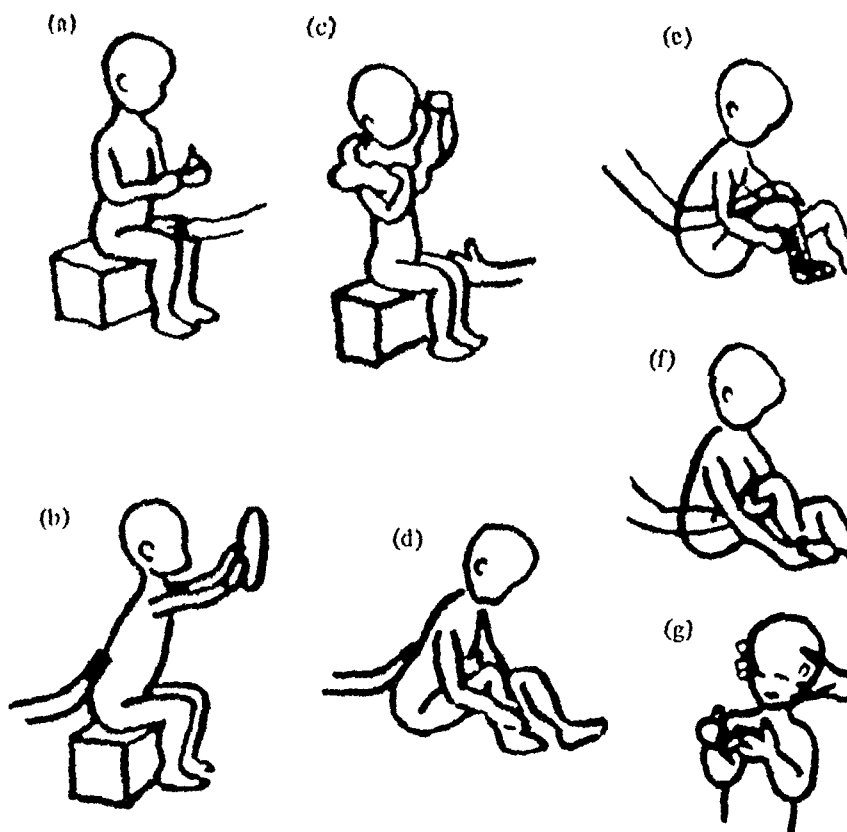
to talk, he should be asked to say the words at the same time as he does the actions. Later on colour can be included in the conversation, comparing the colour of his clothes with other things around him. This can be followed, when he has reached the stage of understanding such things, by showing him which is the top and bottom, which is the right side and the left, which the inside and which the outside. In this way he will not only be learning how to dress himself but also accumulating knowledge which he can use in other activities.

It is important, when finding out the difficulties the cerebral palsied child has when he starts to co-operate and take over his own dressing or undressing, that we try to understand *all* the problems involved, not merely those of manipulation. Your child's therapist will, of course, explain to you the specific problems with which he has to contend.

Parents should understand why a child is unable to put on his socks. Perhaps he cannot distinguish the tops from the toes, or see the openings, or understand what is being asked of him. He may be unable to bend his hips sufficiently to enable him to bring his arms forward to reach his feet, or cannot bend one leg at a time, and his mother's attempts to bend his knee may result in his hips becoming straight, making him either fall backwards or, in some cases, collapse forwards. He may not be able to grasp when his arms are straight out in front of him, or to hold his socks and, at the same time, to pull them up; or he may drop the sock when he turns his head to look at his hand. His balance may not be secure enough in sitting, and he has to drop whatever he is holding to use one or both hands for support. These and many more problems may prevent him from putting on his socks—i.e. not one difficulty but a number of difficulties interacting on each other. We must analyse his problems carefully and help him with them before we can expect him to be independent (see Figs. 65 (a)-(g), page 94).

When he starts to dress himself, watch carefully to see exactly how





*Figure 65. If your child has the following difficulties, suggestions of points illustrated before he makes the movement.*

- (a) The athetoid child when making an effort to speak, or as he raises his arm to dress, his feet may come off the floor and his legs may part. In this case : pressure down over the knees keeping them together, or apply pressure on the feet.
- (b) The spastic child when lifting his arms may extend his hips and knees and lean backwards. In this case place your hand on the lower part of his spine and push him forward. With very spastic children keep the trunk well forward and at the same time hold the legs apart and outwards at the hips.
- (c) When the spastic child uses one hand to dress or pulls his clothes down on one side, one leg may fall 'outwards' pulling his pelvis round and upsetting his balance. Place a hand on the outer side of the leg to prevent this.
- (d), (e) and (f) Pulling socks up, one leg may straighten and he will fall back on his arms and losing his grasp. Placing your hand on the lower part of his spine will help to keep his hips and legs bent and enable him to keep his shoulders forward and use his hands. If his grasp is poor when his arm is straight, help by keeping the leg bent by holding under his thigh. If the bending of one leg makes the other straighten use the same grasp in (f) to stop this.
- (g) Looking at their hands while they use them is difficult for many cerebral children. Green shows gives good control of the head.

his legs stiff and hips straighten, or in the athetoid child, causing his feet to lift off the ground and lose his balance;

- (c) trying to hold with one hand while he moves the other;
- (d) having to hold and lift his clothes, especially pulling them over his head, without falling back; opening his clothes, for which he will need both hands;
- (e) starting to put on his sock and reaching down to his foot to pull it over the heel;
- (f) starting to pull down his pants; doing up and undoing fasteners, especially those at the back, and so on.

(a)



(b)

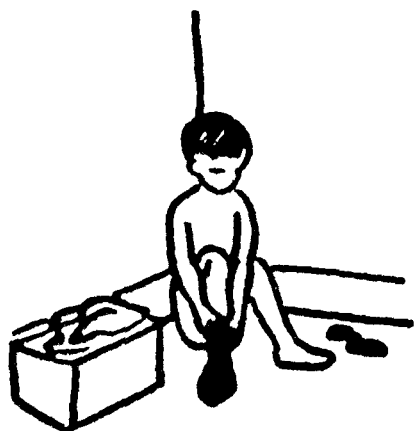


(c)



to open. This, as we have explained earlier, can be avoided to some extent, if you first see that he is sitting symmetrically.

3. If you have difficulty in getting your child's arm through the armhole or sleeve because he is pulling back at the shoulders, see that he is bending forward sufficiently at the hips, as this will make it easier to bring his arms forward.
4. If your child is inclined to fall forward in sitting, the pressing down of his head and arms should be stopped before you start to dress him.
5. Always bend your child's leg before putting on socks and shoes, as with a straight leg the ankle and foot are stiffer and the toes more apt to turn under.
6. When putting on nappies have a pillow under the child's head or under his hips; this will make it easier to bend his hips and knees and to part them.



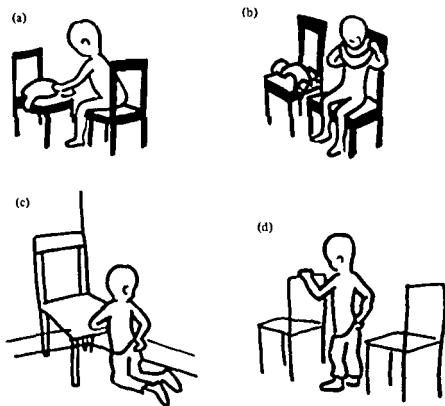
*Figure 67.* Where balance in sitting is still not good enough to allow the child to have both hands free to dress himself and he has the tendency to fall backwards, use the corner of the wall to give him support. See that his clothes are within reach by his side, and if necessary have a stool or chair for him to hold.

These are only a few general points of advice and obviously they may need adapting to meet the specific difficulties of each child.

Do not continue to dress and undress your child out of habit or just because it is quicker. If he is ever to learn to be independent, he must first be taught what to do and how to do it, and then be encouraged to try for himself with guidance.

Finally, but very important, he must be given a chance to manage on his own, remembering that he will learn to undress himself before learning to dress. This has the advantage that undressing is usually done

in the evening when there is less rush and one can be more patient. If pressure on your time is a problem, the week-end is often a good time to allow the child to experiment. Leave him alone one day, when you feel he should be doing more for himself, while you carry on with your work, and on your return you may be surprised to find what his capabilities really are. Children can be very crafty; we have known cases where a mother has been called to the front door or the telephone to find, on her return, that her often bored and apparently helpless child has dressed himself, something which up to that moment no one believed he could possibly do.

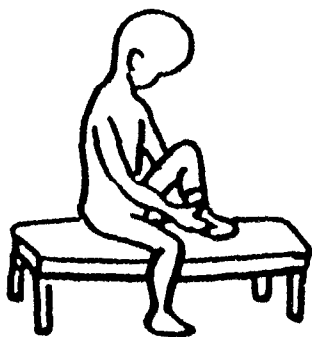


*Figure 68* Give the child confidence when he starts to dress and undress himself. Place a chair or table in front of him so that he can use it for support when necessary, place his clothes out for him to begin with.

Figs. 67, 68 (a)-(d), and 69, pages 96-98, suggest various positions which will make it easier for the child when he starts to dress himself, and later to manage on his own.

## Clothing

All mothers will no doubt have chosen clothes most likely to make their task easier when they dress their child, or which are simple for the child when he starts to dress himself. The following suggestions may be found generally helpful.



*Figure 69.* By turning sideways when sitting on a box or stool, the spastic child may find it easier to bend one leg without straightening the other and to reach his foot. Balance also will be better in this position.

## MATERIALS

Other than for linings, avoid materials that have a slippery surface, such as nylon, and be careful not to have a rough surface next to the skin as rubbing will cause irritation very easily. Nylon material not only makes picking up and carrying the child more difficult, but if he sits on a chair with a slippery surface it becomes harder for him to balance.

Knitted clothes or jersey cotton, are usually the simplest to take on and off, as they allow plenty of 'give'. With the tweed types of wool on the market even top coats or cloaks can be made of wool. (This advice, of course, is based on climatic conditions in the U.K.)

'Terylene' and 'Bri-nylon' are good because of their non-shrinking properties. We learn that 'Quarpel', an all-proof material—unfortunately not yet available in Britain—is widely used in the United States and we have some excellent reports on this material and also on *waterproof* nylon. 'P.V.C.' and allied materials are good for overalls as they can be washed down without being taken off. When used for feeding be sure they are the type of overalls with deep pockets around the front of the hem.

To sum up, we recommend that the most suitable materials should have the following qualities: non-slip, non-shrink, and be light and washable.

Some suggestions on the most suitable types of clothing for the cerebral palsied child

- (a) *Vests*. The most suitable are those which have the largest openings for the head. The envelope cross-over opening is the most satisfactory; for the older child shoulder straps.
- (b) *Pants*. For a baby or severely handicapped younger child, press studs, zips or lacing at each side save a lot of lifting when putting them on. For the older child, elastic-top pants.
- Pyjamas*. Elastic type neck opening, slip-over blouse, top with no buttons, elastic top to the trousers.
- Night-dress*. For the young child, back opening with tapes will make potting easier.
- (c) *Jerseys*. The most important point about a jersey or T-shirt is to have an easy opening for the head; often they have elastic woven into the material around the neck opening—this is excellent. A polo neck is also good.
- (d) *Shirts*. One of the difficulties with shirts is to keep them tucked into the trousers. This can be remedied by buttoning them on to the trousers or by means of tapes sewn to the bottom of the shirt. For  
shanks, can be placed through the link holes and can remain there permanently. To save buttoning and unbuttoning, edge each side of the opening of the front of the shirt with 'Velcrome'.
- (e) *Dresses and Blouses*. Blouse and slip combination for the older child. The shift or pinafore dresses are the most practicable as they are simple to put on and need no fastenings. They can be made of a variety of materials and are also easy to knit, a T-shirt, blouse or jersey can be worn underneath.
- (f) *Overalls*. In materials such as 'P.V.C.' that can be sponged down, and with back fasteners
- (g) *Sleeves*. All sleeves should be as loose as possible. The raglan or dolman sleeve provides the largest opening for the arm; this type of sleeve can be found in a variety of garments. It is equally important to have an opening at the bottom of the sleeve large enough through which to slip your fingers and pull the child's hand through. Opening the seam from the neck down the arm will make it easier in some cases to get the head through.
- (h) *Tights*. For young children tights that come right up and fasten at the shoulders; i.e. using the same shape as for dungarees save an extra layer of clothes and keep them warm.
- Trousers*. Short trousers are best for the child when he is still in

nappies as handling will be easier: the 'Lady Bird' terry towelling all in one type of garment are excellent for young babies. Dungarees are preferable to long trousers, especially when the child starts to move around. We have found 'Bri-nylon' cat-suits are also excellent. It is possible to do away with zip or 'fly-buttons' by having no front opening and elastic tops to the trousers instead of fastenings. For the more severely handicapped child trousers with openings down the inside of the leg will make handling easier.

- (i) *Coats*. These are usually hardest both to put on and take off; a cloak on the other hand is extremely simple as it has no sleeves. All types of material can be used; a removable hood for the winter can be attached with press studs. Waterproofs are also made in a cloak design. For a baby a sleeping bag can be a good substitute for a coat.
- (j) *Shoes*. If a child is not walking and cannot keep his shoes on, a soft leather sole can be sewn to a knitted sock or tights. Special shoes and boots are often prescribed for the child; they can be built up on the inside or outside, or have platform heels or without toe caps. There are now on the market materials that are excellent for reinforcing the toe caps, such as colourless 'Northill' plastic, or acrylic of the Swedish type, both available from dental suppliers. Whatever alterations are made to the shoes it is essential to watch the child carefully for the first two or three weeks of wear so that any changes can be made immediately. For mildly affected children and some hemiplegic children we have found 'Scholl's' sandals very good. 'Inneraze' shoes and sandals are also advisable for some children. Elastic shoe laces do not require lacing or tying thus saving time and frustration.
- (k) *Gloves*. Mittens are sometimes easier to get on than gloves, especially for the hemiplegic child, and if tied with tape and brought over the shoulders and down the sleeves, will prevent him from losing them.
- (l) *Hats*. These are often difficult to keep on. The hood type with snap fastener or combined hood and scarf are useful.
- (m) *Fasteners*. Do without them whenever you can; but if you have to use them see that they are easily accessible and not at the back except for overalls and nightdresses for very young children. When your child is small, shoulder fastenings are the simplest. 'Velcrome' is a strong substitute for a zip and will stand up well to washing; it now comes in a variety of colours. Avoid buttons where practicable; if you have to use them, and your child is at the stage of learning to dress himself, use a press type fastener at the back of the button rather than a buttonhole. Side openings should always be on the more affected side so that he can use his good hand to fasten, etc. Discarding

fasteners not only makes it easier for the child, but also cuts down the time taken for those dressing him.

- (n) *Cat suits*. Many parents find cat suits made of stretch nylon wash better than 'Bri-nylon'. The type of suit with thick studs on the shoulders has been found more satisfactory than zip fasteners, which are inclined to pull the material and hurt the child between the legs.

Finally, avoid tight clothes. It is wiser that all clothes be loose fitting; so buy the next larger size. Tight socks, for example, can do as much damage to the feet as tight shoes.



## FEEDING

A general guide to the normal developmental stages that lead to self-feeding

- (a) Babies of a few weeks often rest a hand on their bottle while being fed, and hold the bottle with both hands at about five to six months. Gradually the hands are brought in front of the infant's face and he begins to look at them.
- (b) At about two weeks and sometimes even earlier he starts to put the fingers of one hand to his mouth without being conscious that he is doing so. This is followed by both hands, and he starts to suck them.
- (c) At about six months, when he can reach out and grasp, he will take a rusk to his mouth, suck it but quickly drop it, almost as though it were a toy.
- (d) At about nine months he will take a rusk to his mouth, but now in a deliberate way as he wants to eat, and he will drop it only when he has had enough or his attention is distracted.
- (e) Some children, at about eight to nine months, will guide their mother's hand when she is feeding them with a spoon, for now they understand that the spoon and the food go together. Babies differ considerably in this and some will never bother to help, or do so only when hungry. Others at this stage will help guide the cup to their mouth.
- (f) Between nine and twelve months a child will pass through the stage of putting his hands into his food for the joy of squeezing it, and then smear it over his face and anything else that happens to be near. At this time also the child will often snatch at the spoon when he is being fed, but will only use it to bang on the table, or plunge it into the food: he is still unable to use the spoon to feed himself.
- (g) At about fifteen months he has the ability to grasp the spoon with his whole hand and feed himself for short periods but in a clumsy way. Finding difficulty in getting the food on to the spoon, he will use his other hand to push the food on, dropping a great deal and turning the spoon over in his mouth to get the food off.
- (h) From now on, through constant practice, his abilities improve rapidly and, by the time he reaches the age of two, he is becoming proficient and usually insists on feeding himself most of the time.

## Feeding and the cerebral palsied child

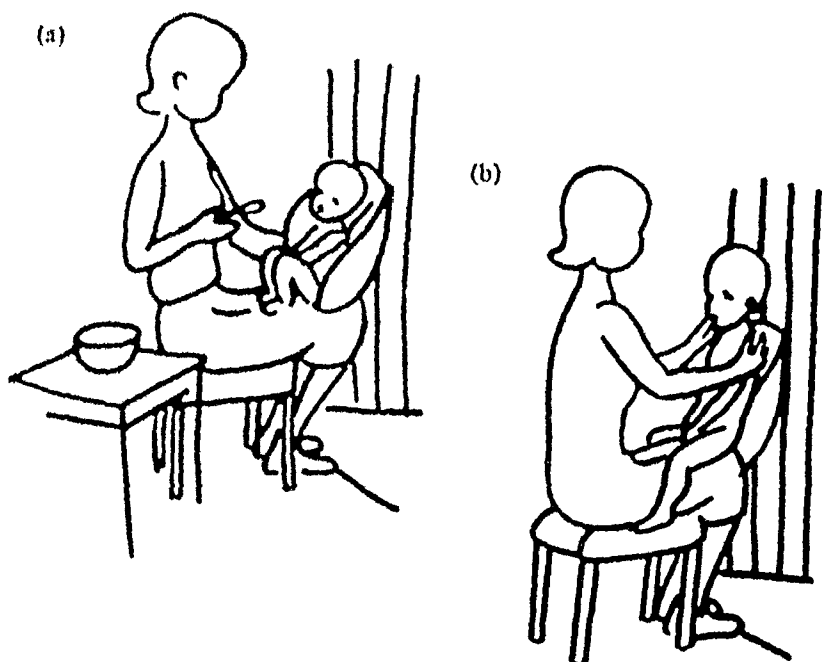
The major feeding problems of the cerebral palsied child are the result of a lack of head and trunk control, lack of sitting balance; an inability to bend the hips sufficiently to enable him to stretch his arms forward to grasp, and to maintain a grasp irrespective of the position of his arms; *difficulty in bringing his hands to his mouth and lack of eye-hand co-ordination*. Once again it must be stressed that only by careful analysis of the child's disabilities and abilities, can we hope to help him. We cannot expect improvement in the child's feeding until we have helped him to acquire the fundamental abilities which will make self-feeding possible, namely, an ability to move his head independently from his body and hands, and a good sitting balance.

### *Some positions for feeding the young cerebral palsied child*

As we have stressed, adequate control of the 'whole' baby is essential while he is being fed. Otherwise he will become more spastic or have increased involuntary movements even before the bottle is placed into his mouth, thereby making it harder for him to suck and use his lips. Whenever possible avoid placing your hand on the back of the child's head for support as this will immediately cause him to push back; instead support him by placing your arm around the base of his skull seeing that his shoulders and arms are well forward; this will enable you to have your hand free to control his jaw and lips when necessary.

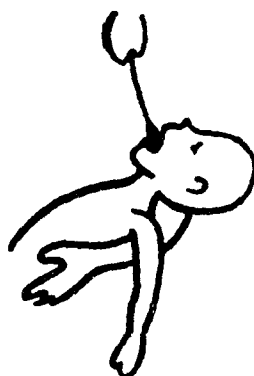
A good position in which to feed a young baby who pushes his head and trunk backward is shown in Fig. 70 (a), page 104, and modified for the older child in Fig. 70 (b), page 104.

When feeding a child with a spoon do not tip him too far back, as this will result in 'bird feeding'. Have you ever tried to swallow or to chew with your head tilted back? It is almost impossible. Feeding in this position means that the spoon has to be placed at the back of the mouth and in this way 'infant swallowing' at the back of the mouth is prolonged. Fig. 71, page 104, shows the food being tipped into the mouth in this way. Fig. 72, page 105, shows the correct position of the spoon, holding it just in front of the child's mouth to encourage him to come forward. In this way he learns to close his upper lip over the spoon to get the food off, and later to use his lower lip which will retract as he takes the spoon out of his mouth. If the child cannot move himself forward, bring him forward towards the spoon, placing the food in at the side of his mouth if he is inclined to push it out with his tongue. Do not put too much food on the spoon at one time and find a rhythm of feeding that suits him. See Fig. 73, page 106, for control of a very flexed baby.



*Figure 70*

- (a) A good position in which to feed a baby who throws himself backwards when you sit him. The baby sits on his mother's lap with a cushion behind him which is placed in our sketch against a wall. A chair or table can be used just as well. Facing the child in this way the mother can deal with any specific feeding difficulties such as poor head control, inability to close the lips when swallowing and in chewing.
- (b) Sit the older child astride your lap which besides making him easier to handle, is a good way to keep his legs apart and hips bent.



*Figure 71*, 'Bird feeding'. Pushing the food into the child's mouth while his head, shoulders and arms remain back, making closing of the mouth and swallowing very difficult.

Do not prolong unnecessarily feeding your child on your lap: as soon as he has developed some trunk balance and head control let him be fed sitting on a chair. Try to see that, when the child is sitting on a chair beside or opposite you, you are on a level with, or a little lower than he is, otherwise the tendency will be for him to have to look up to you and push back his head.

If we look at the developmental sequences of the normal child we can see how head control is directly linked with chewing and babbling. The first step when you feed your child, therefore, is to control him in

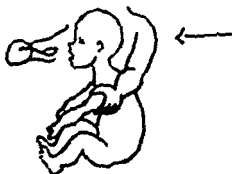


Figure 72 One of the ways of controlling a child who pushes his head back when he is being fed. The more severely affected child may also need his head supported by the top of your arm at the base of his head.

such a way that you stop his general tendency to throw himself backward, to slump forward, or to lie in an asymmetrical position, before you help him with any specific difficulties of jaw, lips, or tongue.

To handle the cerebral palsied child well, either while you are feeding him or when he starts to feed himself, it is important to realise how his specific difficulties are directly related to total abnormal patterns. For example, an open mouth, or a tongue thrust are part of a pattern of total extension—a jaw and tongue that deviate to one side are part of a general pattern of asymmetry. Lack of head control means that the child does not have the stability necessary for the jaw, lips and tongue to work in a co-ordinated manner.

The early patterns of feeding are so closely linked to the development of future patterns of speech, that any abnormal feeding patterns that are allowed to persist or develop will certainly affect the child's attempts to babble and, later, to make articulate sounds. By working closely with your speech therapist in preventing faulty feeding patterns you will also be helping the child to develop movements of the mouth, tongue and lips which he will need when he starts to speak.

It would not be practicable in this book to attempt to deal in detail with the many problems that arise in the feeding of the cerebral palsied child. These problems need careful analysis and individual advice and can only be dealt with competently by experts. We hope that the following will help to a better understanding of some of these difficulties.

### Some common problems

**Open mouth.** One of the most common problems of the cerebral palsied child is a constantly opened mouth, and it is important to realise how this will affect his breathing, feeding and speaking, and also cause him to drool continuously. An open mouth is part of the total pattern of extension which we must, correct or control not only during feeding times but in all his activities.



*Figure 73.* Controlling a very flexed baby as you feed him, sitting astride your knee, a high table will help to keep the child's arms up and forward, leaving your hand free to support his head and jaw.

**'Tongue thrust'.** Some children when feeding have a 'tongue thrust' which prevents food from being taken into the mouth. To overcome this difficulty they must learn to swallow with the mouth shut. Your child's speech therapist will be able to show you the techniques to control the jaw and lips.

**Difficulty in sucking.** Many cerebral palsied children have difficulty in sucking, due to their inability to use their lips and tongue adequately, and to poor breath control, which causes them to choke. The 'gulping' of large amounts of air may be prevented to some extent by using an old-fashioned 'banana' or 'boat-shaped' feeding bottle which will give a slower and more even flow of milk.

To bridge the gap between sucking from a bottle and drinking from a cup, a polythene or polyester tube of small diameter can be used. If the child has difficulty in getting the liquid through, use a short tube, placing it in a horizontal position. 'Gulping' air and choking is also a difficulty experienced by the child when drinking through a tube. It has been found possible to regulate the flow of liquid by inserting a ball-bearing into the tube. The address from which these tubes can be purchased will be found at the end of the book. On no account should parents try to make these tubes themselves: unless the ball-bearing is properly inserted and fixed there is a danger of the ball being sucked or gulped up with the milk.

The bite-reflex, i.e. the immediate biting on anything introduced into the mouth, should start to be modified in a normal child at around the fourth month. This precedes the chewing reflex which appears at about the seventh to eleventh month. Stimulation of the chewing reflex in the cerebral palsied child will in itself help to modify the bite-reflex.

**Chewing.** A child normally starts to chew at about the age of seven months; at about eighteen months he will be able to start eating foods that are more solid, and by the time he is three years of age he will be using an adult pattern of chewing which involves a rotary action of the jaw.

It is most inadvisable to keep a cerebral palsied child on a diet of liquids and mashed foods indefinitely; he, like a normal child, must have the stimulus of semi-solids and solids to activate his lips and tongue in preparation for chewing which will be impossible if he lives only on foods that need sucking. This transition from semi-solids to solids will only be possible if the child's difficulties are first carefully analysed by the speech therapist and treatment carried out by you at home before and during feeding times.

To be able to chew, as we have said, it is essential that the tongue and lips are active. A simple method of stimulating tongue and lips is to place chocolate spread, or peanut butter, on the tip of the tongue and around the lips. The tart taste of lemon or salt, and, under the guidance of your speech therapist, ice cubes, may also be used. It is important that the whole of the tongue is active so that it can move the food around in the mouth for chewing and be able to reach between the cheeks and the gums and even to the roof of the mouth. 'Hundreds and thousands' (small pin-head sized pieces of sugar used for cake decoration) have been found useful for placing on and under the tongue and between the cheeks and gums. Even when the child has developed the necessary movements for chewing he will need plenty of practice apart from feeding times. How this should be done, and the most suitable foods to use,

taking into account the child's likes and dislikes, will be explained to you by your speech therapist, who will also show you the correct way to stimulate the child's teeth and gums and the inside of his cheeks, and how to hold and move the jaw to facilitate the movements of chewing.

The various cutters supplied with food mixers are a great help in grading food from the semi-solid stages to larger pieces.

#### THE FIRST STEPS TOWARDS SELF-FEEDING IN THE CEREBRAL PALSIED CHILD

During the first months, as already mentioned, a normal baby starts to look at his hands and to take them to his mouth. Two or three months later he begins to put everything within reach into his mouth. He also acquires the ability to close his lips around his fists or fingers and can both suck and chew anything he can get to his mouth.

The athetoid child and the severely spastic child are often unable to reach even the stage of being able to bring the hands before the face, far less to hold and bring an object to the mouth. It must be appreciated, that there is a clear difference between the problems of these two types of children. The arms of the athetoid child are held away from the body, head control and ability to focus the eyes are poor, and grasp is weak and ineffectual. The spastic quadruplegic child (whose whole body is involved) has both arms pressed against his sides or over his chest with the hands clenched, usually with the thumbs tucked across the palms, and has great difficulty in opening his fingers.

On the other hand the spastic diplegic child (whose head, arms and hands are slightly affected) has no difficulty in reaching the stage, at about five months, of being able to take things to his mouth while lying on his back or on his tummy at play. However, this child's difficulties will be seen when he is sitting. Having no sitting balance he has to rely on his arms and hands for support, and if he lifts up an arm to take his hand to his mouth or leans his head slightly back, he is in danger of falling backwards.

The hemiplegic child will be able to follow with little difficulty the normal developmental sequences leading to self-feeding, but will only use and look at his good hand. If his sitting position is poor this will result in an increase of 'associated reactions' (see glossary) in his affected arm and hand. He will, experience difficulty when he starts to try to use a knife and fork. There is little point in forcing the child to use his affected hand unless he has a good grasp with that hand and can move his arm freely. The problem is that when trying to use a knife and fork the effort of cutting meat with the good hand makes the affected arm and hand too stiff to handle a fork and bring it to his mouth. This

is another example of an 'associated reaction', and one that can be overcome by allowing the child to eat in a manner often adopted by adults, that is, first cutting up the food, laying down the knife and using the same hand to lift the fork to the mouth. The child should gradually learn to hold a fork in his affected hand and apply pressure with his index finger. This is an isolated movement and he will have first to learn to point with his index finger while he keeps his other fingers bent before he can be taught to press down with a straight index finger. *It must be remembered that even a normal child is not proficient in using a knife until he is about five years of age.*



*Figure 74. If the child has a tendency to fall back when he lifts his arm to take his spoon to his mouth, give support as illustrated, rather than tying him in his chair.*

When a child is learning to feed himself do not expect every mouthful to be a success: be prepared for a mess! A P.V.C. overall with long sleeves which fastenes down the back is a 'must' at this stage. He should be given plenty of time, and praise for achievement, otherwise he will soon lose interest and be happy to let you continue to feed him.

Until the child has acquired sufficient balance in sitting he must be adequately controlled in his chair so that he has both hands free. The first essential here is a suitable chair, and, when necessary, groin straps or a simple belt around the middle. In the case of the athetoid or ataxic child, a strap over the feet to keep them down often provides adequate stability, but only adopt this method as a temporary measure. Control as illustrated in Fig 74, page 109.

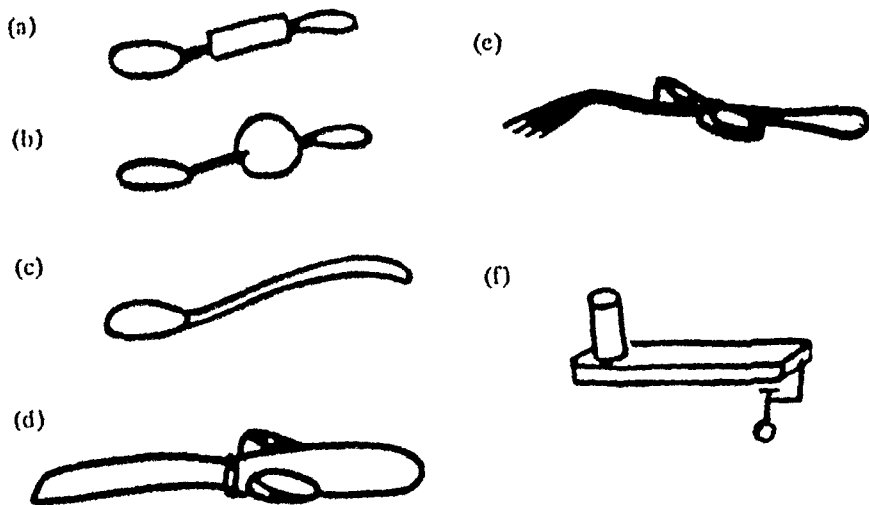
A very firm cushion or sandbag placed across the base of the spine, no higher than 4 in., will help the child to keep his hips bent and give him stability.

The type of table used *must of course* depend on the severity of the child's handicap and age. If a *clandestine* table helps him towards self-feeding, use one, but as soon as possible use a normal table.



Although we feel that 'gadgets' for feeding should be kept to a minimum we have found the following useful.

For the child who has difficulty in getting food on to the spoon, the steep sides of a small bowl will be found more satisfactory than a plate. A suction pad underneath will prevent it from slipping. If a deep sided plate can be managed, use the type that can have hot water put into the base to keep the food warm, as so many cerebral palsied children are slow eaters.



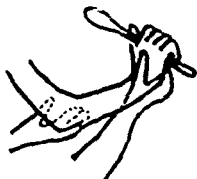
*Figure 75.* Simple modifications to normal spoons, forks and knives. We include in the sketches (c) an ice cream spoon which many cerebral palsied children prefer. (a) Round wooden peg. (b) Rubber-ball. (d), (e) Built-up fork and knife as described on page 110. (f) A table can be attached to the side of a wheel chair or clamped to an ordinary table if it is too low.

The handles of spoons, forks and knives should be 'built up' for the specific needs of the individual child, but it must be emphasised that these should only be used as a temporary measure. Plastic wood which can be bought at any hardware store and comes as a soft paste in a tube or tin can be used for 'building up'. There are other substances on the market but these have to be 'cooked' first.

One method of application is as follows. First cover the handle of the spoon, fork or knife that is to be built up, with adhesive tape; this will help the plastic wood to adhere to the handle. Mould the supports you require and when they are dry and hard they can be enamelled. These supports on the fork and knife for the thumb and index finger are built up for more advanced feeding and help to get an isolated finger

movement. (see Figs. 75 (a)-(f), page 110). Learning to use a knife is particularly difficult for some children but there are combined knives and forks available that are most useful.

The cerebral palsied child, like a normal child, will at first find it easier to hold a larger handle which he can grasp with his whole hand, rather than a thin handle which has to be held with the fingers.



Before deciding which kind of spoon to give your child to use, try all types and sizes, including a long-handled ice-cream spoon. You may be surprised to find that the spoon he can manage best is a dessert spoon; too often a child is given a teaspoon as a matter of course, a spoon which, for many cerebral palsied children, is the hardest of all to use. Some athetoid children find a fork easier to manage than a spoon, but care should be taken to see that the child has sufficient control as the involuntary movements of the arm and hand may make the use of the fork dangerous.

For drinking, it will often be found that a normal child's baby beaker with a spout which controls the flow of liquid is a useful step towards a cup especially when the child is unable to hold his breath adequately, which is necessary for continuous drinking. This beaker has small holes in the spout which restrict the amount of liquid flowing into the mouth, yet the liquid does not need to be 'sucked' into the mouth as in the case of a bottle or tube. Some manufacturers leave the spout sealed so that one can pierce the number of holes needed. This type of cup is particularly helpful for cerebral palsied children who cannot close their lips to swallow, and should be used wherever possible in preference to a spoon, as the amount of liquid a child can take from a spoon is very limited.

It must be stressed that these beakers should only be used as a temporary measure, and that the aim is to get your child to drink from an ordinary cup. Start with a large two-handled mug: only when he becomes proficient with two handles should he try a cup with one handle.

As with all functional activities the child will profit from practice, so work first with an empty cup, giving him the idea of the movement required, and gradually add increasing amounts of his favourite drink.

What has been said in the foregoing is only a brief guide for those dealing with the feeding problems of a cerebral palsied child.

Despite the difficulties, meal times should be enjoyable for the child and for parents. Try not to become over-anxious as he too will become over-anxious.

Remember, that to teach your child to wash his hands before and after his meals, and to wipe his mouth and hands after he has finished his meal, are important items in his programme of self-feeding.

### **Dental care**

A leading dental surgeon has kindly provided the answers to the following questions which, we are sure, will be of help.

- (1) How often and how young should the child be before having his teeth seen?

The child is never too young. In preference, the child should be seen at the same time as the parents or brothers and sisters. If the child attends at a sufficiently young age, not only will he become accustomed to going to the Dental Surgery but the chances are that no treatment will be necessary for the first few visits and this is of the optimum advantage in gaining a child's confidence. Every child should be seen by a dentist at four-monthly intervals.

- (2) Advice on cleaning teeth.

While the deciduous (milk) teeth are erupting, it is both necessary and easy for a parent to clean the teeth with cotton wool dabbed in bicarbonate of soda or saline or even water. At about 2 years old, the parent should use a small infant-size toothbrush with water and gradually introduce toothpaste.

- (3) The advantages or disadvantages of an electric toothbrush?

The advantages of an electric toothbrush for these children are considerable. Several independent studies in the United States have shown that handicapped children using electric toothbrushes have substantially healthier mouths than those who do not. There are mainly two reasons for this. firstly, it is sometimes difficult for these children to make the correct brushing action with an ordinary toothbrush whereas the electric toothbrush does it automatically and is easy to use. Secondly, the electric toothbrush massages the gums and supporting tissues of the teeth (normally, notoriously spongy and swollen in a lot of these children).

- (4) Any special instructions to parents on the care of their child's teeth?

The most important point of all is diet. Handicapped children are particularly difficult to treat dentally, therefore it is more important than ever that the parent should be exceptionally careful about the child's diet. This means the avoidance as much as possible of all sugary foods. This includes, in particular, confectionary and sugar-containing drinks (e.g. vitaminised syrups, squashes). If the child does have sticky foods, then these should be restricted to meal times only. The child should be encouraged to eat detergent foods (e.g. apples, carrots, etc.), even if these are grated, in preference to sugary foods.

Lastly, because of the difficulty in treatment, those children not living in fluoridated areas could usefully take fluoride tablets which provide a high degree of immunity to dental caries. They can be bought at most retail chemists and are usually taken one a day. They are most effective for children between 5 and 12 years but of course can be taken until they are 18 years of age.

## PRAMS, PUSH-CHAIRS AND CHAIRS

In this chapter we shall deal with some of the problems that may arise when the child is in a pram, push-chair or chair, attempting to give some practical advice on these problems, and trying to point out the ways in which they can be dealt with.

As each child has his own problems and difficulties, and no two children are alike, there is no perfect solution. It is only by the careful observation of each child that the correct choice of pram, push-chair or chair can be made.

We shall use the same fundamental principles mentioned earlier, namely, looking at the child as a whole, realizing what movements he should be able to make, and therefore how he should sit and move when he is in his push-chair, or chair, and understanding the reasons for his difficulties.

It is essential that a child should at all times be given the opportunity of using whatever potential abilities he may have, allowing him to control and adjust his position by himself whenever possible, and in this way learning to get his own balance. Therefore, the outside support given him and the adjustments advised should be restricted to the absolute minimum, just sufficient to prevent him from going wrong without interfering with his own movements.

### The pram

When selecting a pram remember to take into account the child's difficulties not only when he is sitting in the pram while it is still but also while it is moving. Select a pram in which the child can sit well. The cerebral palsied child is given a valuable opportunity to see and hear when sitting out of

lution. Nothing can

lying flat on his back, gazing at the hood of the pram or at the sky.

What are the difficulties which will face the child when he is sitting in his pram? He may lack head control, thus being unable to sit unless he is completely supported. He may push his head against the pillow whilst straightening his hips and legs, causing him to slip down; he may bend too far forward, allowing his whole trunk to fall forward, making it impossible for him to lift his head and to look around, or he may col-

lapse and fall over to one side. To avoid any or all of these from happening, it is important that the child is supported where necessary when sitting in the pram.

### The push-chair

Many of the difficulties mentioned in connection with prams will also be met with when using a push-chair; there are, however, additional problems. Is the seat or the back of the chair too soft, thereby making it impossible for the child to sit up and back at his hips, or making it impossible for him to lift his head owing to the rounding of his spine and the downward pressure from his shoulders? Is the foot rest the correct height, not too high nor too low? If it is too high the child may push against it with his feet, his head and body go backwards and his legs straighten and tend to cross, with the result that he will slip forwards. If, on the other hand, it is too low, only his toes will come into contact with the support; this will have the effect of making him extend his legs and hips. Care should be taken to see that the seat and the foot-rest do not become lop-sided, due to uneven pressure of weight by the child who is inclined to take his weight over on one side. A child may feel nervous in the push-chair, perhaps because his balance is poor and he is afraid of falling forwards or, maybe, because he has the type of push-chair in which he sits with his back to his mother.

There is at the present time no ideal push-chair; therefore before finally deciding, try a number of different types. Choose a basically simple model, for this is always easier to adapt. When you are buying a push-chair do not merely choose one from a catalogue, but take your child to the shop with you and try out the various models rather than find out the problems when you have bought the push-chair. Many shops will allow you to have a push-chair on approval and you should take advantage of this service. See how your child balances, not only when the push-chair is stationary, but also when it is being wheeled.

Some of the following points may help when you are adapting the push-chair. Make sure that the *back rest* is firm; we have used a thin piece of plywood with a layer of foam rubber covered with washable material. Make sure that the *seat* is firm; here again a piece of thick foam rubber is useful. Cover the foot-rest with a rubber surface. Some children push themselves backwards when their feet come in contact with a firm surface; it is advisable in these cases to dispense with a footrest until he has learned not to push back.

If the child's feet turn in excessively, his hips and knees will also turn in and most likely one leg will bend more than the other. Fig. 81 (b), page 121, shows how, by the use of two padded blocks screwed

onto a chair, the legs can be kept apart and the hips turned out. The push-chair can be similarly adapted.

If groin straps are needed for the child who has no sitting balance, make sure that the angle of the straps across the groins is correct; the straps should be tied downwards and backwards. If they are too high, or tied too tightly, they can cause the child to have a spasm in the muscles of the hips so that he falls forwards and cannot lift his head. Another possible and painful effect might be that the child will hollow his lower spine and at the same time throw his shoulders and arms back.

For the child who is afraid of falling forwards, the normal type of tray fitment or a broad piece of webbing will give more confidence. The webbing need not be attached to him; it can be stretched in front of his waist. Having the sides of the push-chair blocked in adds to the feeling of security. The lack of stability, balance and head control of an athetoid child can be partially counteracted by placing a small sandbag by the side of his hips, or a wooden rail across the end of the arm rests to hold on to.

### The chair

What are the basic requirements for a suitable chair? The chair should enable the child to achieve a good head and trunk control so that he can balance, giving him every chance to move forward at his hips and shoulders in order to bring forward his arms to use his hands. A suitable chair, as we mentioned when describing the push-chair, may be a simple one that can easily have the required adjustments made to it. We have found that a normal child's arm chair or, for the older child, a wooden kitchen chair, not varnished or polished, is the best.

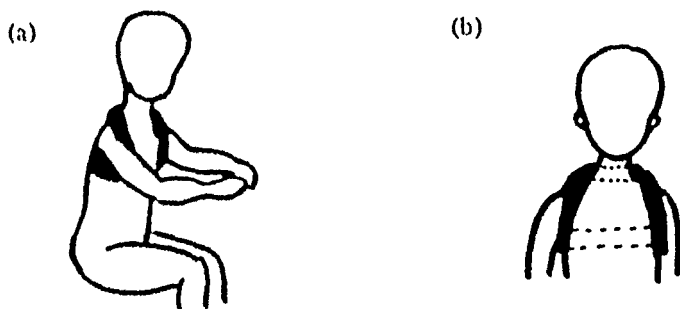
If the child is severely handicapped, the chair must not only be easily adaptable but be of a sensible height, so that handling the child is made easier. A child with no trunk control must be adequately supported if he is to control his head; but for the child who is beginning to get his sitting balance, it is just as important for him to sit on a stool or box without a back-rest, i.e. with no support, so that he can practise balancing and learn to regain his balance.

Think carefully of the occasions when the child will be using the chair. For example, for a severely handicapped five year old, it is far better to have a small wooden arm chair that can be adapted to his particular difficulties, so that he can join in the activities of his friends who will, most likely, be sitting around a small table or playing on the floor. Small castors can easily be fixed to the back legs of the chair to make this type of chair mobile. The child may also need a special high chair for meal-times but this should not be used at other times. Whenever possible he should sit in the chairs that are in general use in his home,

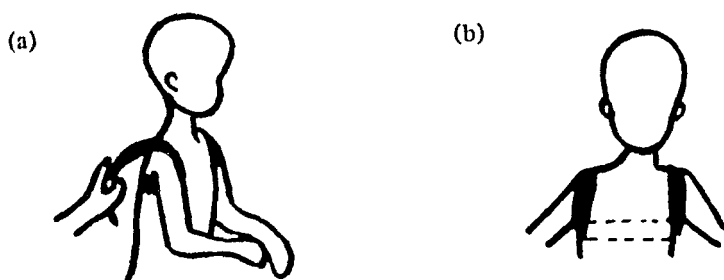


including the arm chairs; the corner of a sofa would make a safe seat for a severely handicapped small child who continually throws himself backwards when sitting.

For the child who cannot sit in a chair because he pushes back with his head, shoulders, arms and trunk, making it impossible to bend his hips, we have found control from the head and shoulders very helpful. Here we use a towel or broad piece of webbing. See Figs. 77 (a) and (b), page 118, and Figs. 78 (a) and (b), page 118, controlling the pushing forwards of the head and shoulders.



*Figure 77. Towelling or webbing controlling the pushing back of the head and shoulders. Place the towel around the back of the neck, over the shoulders, under the arms and tie or fasten with 'Velchrome' behind the neck. Note: the dotted line in sketch is an extra band that can be added to stop the towel slipping.*



*Figure 78. Towelling or webbing controlling the pushing forward of the head and shoulders. Place the towel across the back, under the arms, over the shoulders and tie or fasten with 'Velchrome' on piece of towel across the back.*

When a child is constantly falling over to one side, one will usually find that one needs to give him support in two directions to help him to sit straight. Observe on which side he is taking his weight, and feel under which arm you get the most downward pressure. Figs. 79 (a) and (b), page 119, illustrate these points and the means by which they can be overcome.

Most athetoid children have difficulty in keeping their heads still and this makes it hard for them to look at what they are doing; a beret with lead-shot inserted into it will sometimes help to give more stability when, for instance, they are trying to read or write. It may also help the sitting balance of the severely handicapped athetoid child.

If an ordinary chair cannot be adapted to meet the needs of the child, an alternative is to use one of the chairs sketched in Figs. 80-88, pages 120-126. Most of these chairs can be made by anyone with an

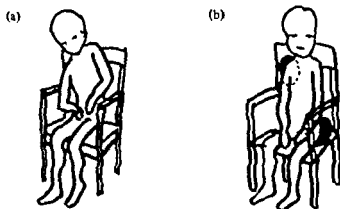


Figure 79

- (a) The child sits asymmetrically, no weight is taken on the left buttock, the head, right shoulder and right side of the trunk bend and push down on that side.  
 (b) A sand bag is placed beside the left buttock to get the child sitting symmetrically. A piece of foam rubber is placed behind and slightly to the outside of the right shoulder to keep the shoulder forward and slightly towards the left. This may not completely straighten the right side of the trunk but may go a long way to stopping it getting progressively worse.

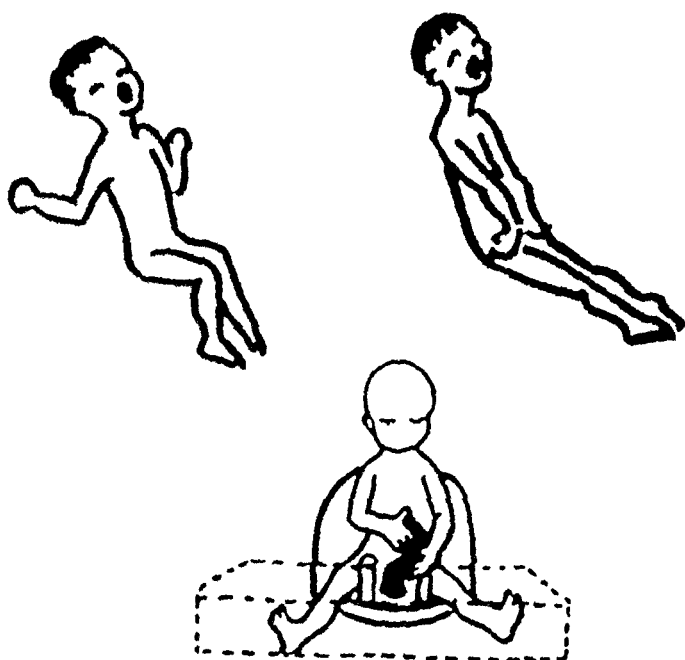
elementary knowledge of carpentry. The chair shown in Fig. 89, page 127 is made from wireless packing cases which, although firm, are easy to cut. If these cannot be obtained, thick foam rubber can be used as an alternative.

Watch closely the child's posture when he is sitting and be prepared to make adjustments to the chair; it is very unwise to postpone making adjustments merely on the grounds that he may need an entirely new chair in a few months' time.

While on the subject of sitting, it is necessary to refer to tables and their use in conjunction with chairs. Figs. 90-92, page 128, show a 'cut-out' table used in conjunction with a roller and triangle chair. Figs. 93-94, pages 129-130, show a way of using a wireless packing case

as a modified table which can be used when the child plays while sitting on the floor. Fig. 95, page 130, illustrates the use of a packing case as a table with a fitment and bar on which to hang toys for the athetoid child.

The distance between the child's chair and the table will vary in accordance with the child's handicap, the usual space being roughly two



*Figure 80.* For the child who shows the postures illustrated, i.e. pushing back with his head, making it difficult to bend at his hips and part his legs to sit, the 'Tri-angle chair' may be of use.

It is made of wood and covered with foam rubber with a washable material on top if required. The two wooden posts should also be covered.

*Note:* The support comes up to the middle of the shoulder blades, the head being left free.

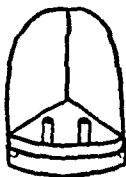
Because of the difficulty the child has in bending from the hips and reaching forward with his arms to play, a wireless case as illustrated or a small box can be used as a table.

inches. For the athetoid child, a table at just above knee level, with the chair slightly away from the table, will help to counteract his tendency to fall backwards at head, shoulders and arms. On the other hand the spastic child will manage better if the table is higher in relation to the chair; this will help to prevent his tendency to lean on the table, pushing down with his arms and shoulders, making it impossible for him to reach forward with his arms. In the case of the ataxic child, the table should

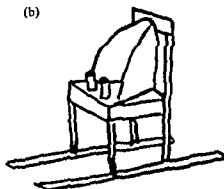
be even higher in relation to the chair, enabling him to steady his arms, making co-ordination of his hand movements easier, until he has learned to time, grade, and direct his movements himself.

Despite what we have said about adaptable chairs, the relation of tables to the chairs, and the fact that they may be comfortable or convenient and so on, we must stress that the aim must be to reach the stage when the child can sit at a table completely unsupported, without adjustments to his chair or for the need of a table to be placed in front of him.

(a)



(b)



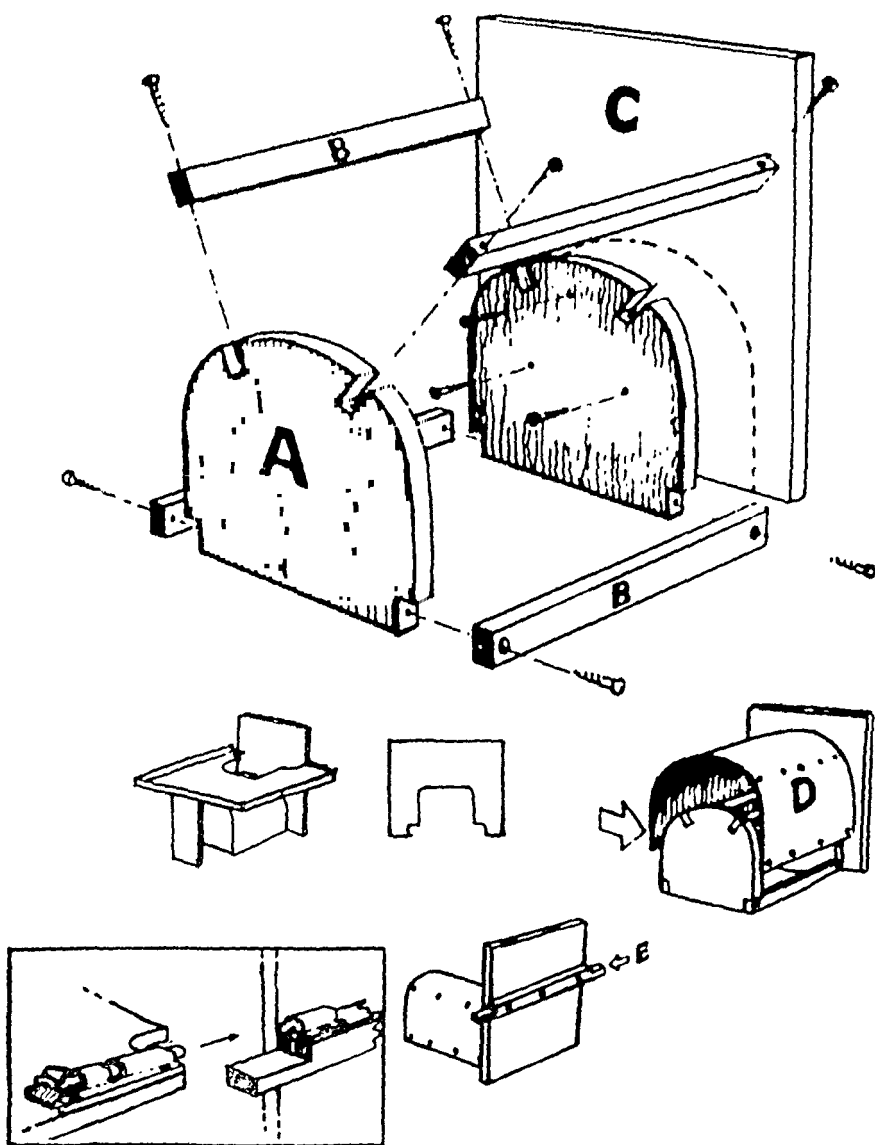


Figure 82. Construction of a Roller Chair.

- (1) Cut two end pieces 'A' from  $\frac{1}{2}$  in. thick plywood or blockboard. The measurements are as shown:

$x$  in. is the height measured from the top of the child's leg when sitting with his feet on the floor, and knees bent at right angles.

Cut slots for the braces 'B'  $1\frac{1}{2}$  in. deep and  $\frac{3}{4}$  in. wide. The top pair of slots should slant as shown.

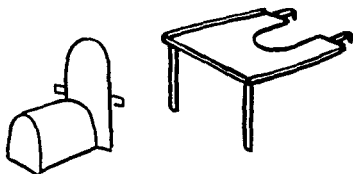
- (2) Now cut the cross-braces 'B', each 12 in. long, from wood of section  $1\frac{1}{2}$  in.  $\times$   $\frac{3}{4}$  in. Glue, *but do not yet screw* these into place. Cut the back rest 'C' from  $\frac{1}{2}$  in. blockboard. This is 20 in. high and 14 in. wide. Screw this as shown with three or four  $\frac{3}{4}$  in. wood screws. The frame now has to be covered with  $\frac{1}{8}$  in. of plywood sheet 'D', 12 in. wide with the grain running across the piece. The



(a)



(b)



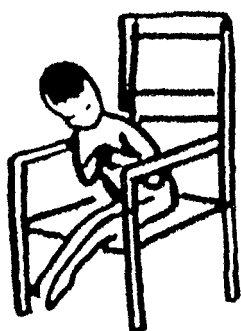
*Figure 83.* A child who lies on his back as illustrated, (a) is unable to sit as he cannot bend at his hips or part and bend his legs. When he tries to use his hands he can only do so by pulling them across his body or near his chest, this reinforces the stiffening of his hips and legs.

Groin straps, or by placing posts between the legs of such a child are quite inadequate. In an attempt to overcome these difficulties the writer devised a 'Roller chair', (b) a modification of the rollers illustrated in this book.

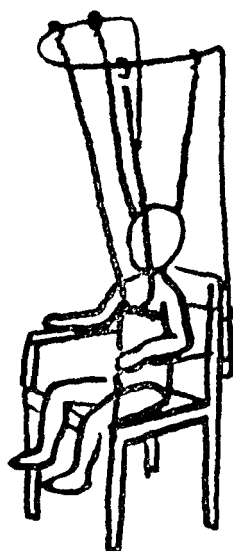
By parting the legs high up it makes it easier for the child to bend his hips and knees and keep his feet flat on the floor and this should enable him to bring his arms forward and use his hands.

*Note* To get correct height of roller, measure from the heel (foot flat on the ground) to top of knee.

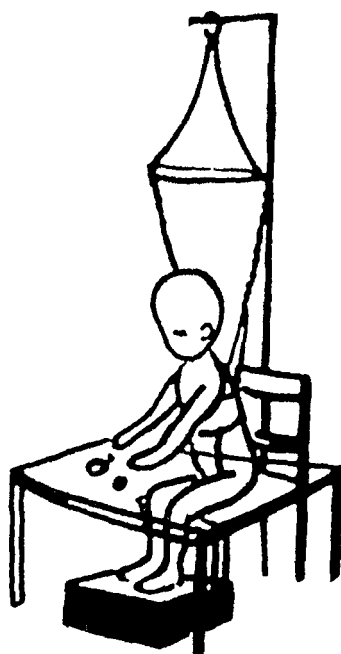
Do not keep the child more than twenty minutes at a time on the chair (as in any chair). Children who show this pattern of stiff hips with crossed straight legs may also if kept too long with legs parted and bent, reinforce this pattern.



(a)



(b)



(c)

*Figure 84.* When a child has poor head and trunk control and is generally rather floppy (a) a 'Halo chair' (b) may be found useful. This idea was devised and patented in South Africa by a doctor. Where the 'Halo' is unobtainable, we have improvised by using a wooden frame and 'baby bouncer' attachments (see fig. (c)).

and knees are neither straight nor bent but remain in a 'mid-position', and he will also have difficulty in lifting his head. On the other hand, if the child lies on his tummy supported by a bolster, roller or on an incline (see Fig. 96, page 131), you will see that he will be able to lift his head and, at the same time, to straighten his back: this in turn will facilitate the straightening of his hips and legs. There will also be less tendency, in this position, for the legs to cross or come together so much. It is advisable to watch that his feet do not become stiff and pointed; when you are present or playing with him always spend a few minutes bending his ankles, i.e. his feet up, for him while keeping his legs turned out, also check to see that his hips are not stiff.

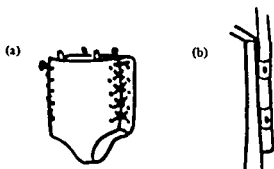


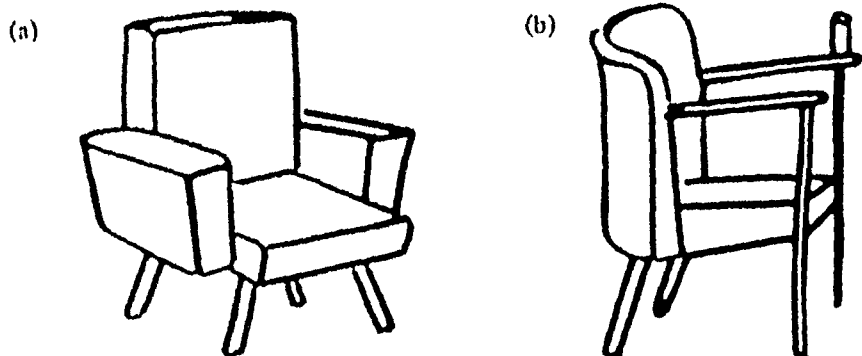
Figure 85.

- (a) When sitting in a 'Halo chair', the child wears a jacket made of a firm canvas material laced at the sides, this reaches level with his armpits. Rings are sewn onto the back and front of the jacket so that the springs attached to the metal halo can be attached to them.
- (b) Shows how the metal arm of the 'Halo' slots into metal rings attached to the back of the chair

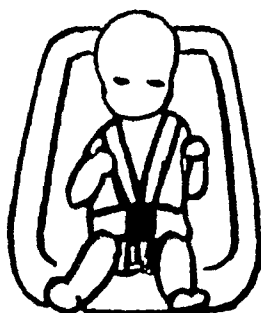
For the small severely affected child who is very stiff when lying on his back, and who cannot be left on his own when lying on his tummy—as he is unable to lift or turn his head in this position—a hammock may be found useful.

A suitable hammock can be made by sewing together two widths of deck chair material and attaching two strong rings to each end. The hammock can be suspended between the uprights of a door frame, or between two trees or supports in the garden. There is no need to suspend it higher than two to three feet from the ground (see Fig. 110, page 137)

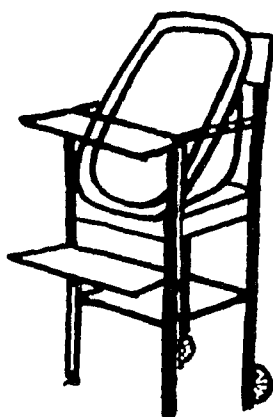




*Figure 86.* These two solid arm chairs can both be purchased in most stores. Illustrated in fig. (b) is a perpendicular post. One can be screwed to each arm of the chair for the child who finds it difficult to adjust his sitting position without something to hold onto.



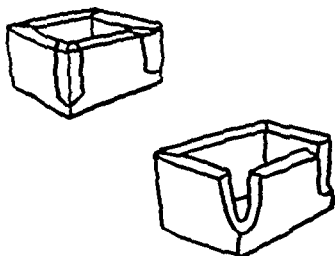
*Figure 87.* The 'Star Rider' car seat we have found most satisfactory for the child with little or no sitting balance or head control.



*Figure 88.* The 'Star Rider' car seat used indoors as a chair. It is attached to the chair at the back. Wheels make it easier to move around the house or into the garden.

The advantages of a hammock, apart from the pleasure it gives the child, are as follows:

- (1) The hammock supports the child's shoulders and brings them forward, preventing the head from pushing back; the gentle sideways movements of the hammock also tends to bring the head into mid-line with the body.
- (2) Lying on the straight hard surface of the floor causes the child to push back and reinforces his spasms, whereas a hammock is soft and moulds itself to the shape of the child's body.



*Figure 89 A small packing case for a wireless, adapted as a seat for a young baby. If the legs are stiff and tend to cross we would cut out the part as illustrated using a razor blade.*

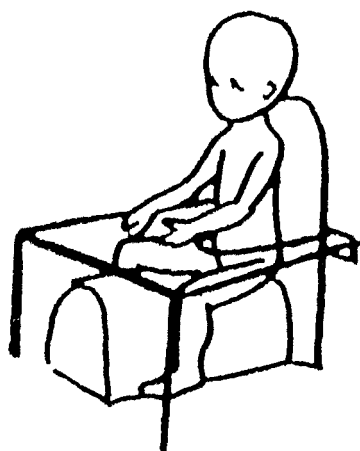
*If the legs are sloppy and turn out excessively the cutout should be modified.*

*These seats can be placed on an easy chair or sofa, as well as on the floor or in a car. They are very light and useful to carry the child around the house in.*

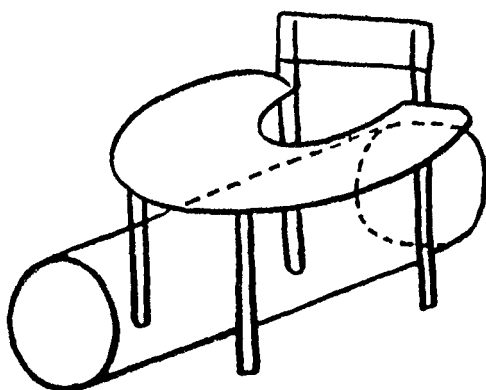
*As the material they are made of is scratchy make a pillow case of towelling and slip them inside.*

*These cases come in three sizes, small, medium and large. See Glossary.*

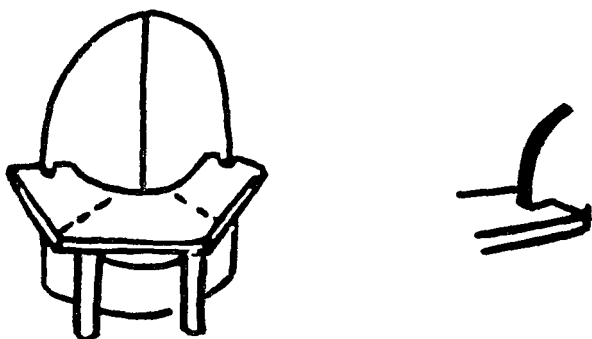
- (3) As the child gradually gets used to being in the hammock he starts to bring his hands together and to put them to his mouth. Very often, for the first time, he sees his feet and realizes they are part of himself, making attempts to reach them and bring them to his mouth.
- (4) By moving the hammock in different directions the child can be encouraged to roll, kick, sit up, play with a toy and so on—another instance of combining play with treatment. Many children enjoy lying on their tummies and being given a swing in this position.



*Figure 90.* Child sitting on roller chair with cut-out table in front. *Note* height of roller level with the knees. There should be a space of about 2 in. between the child and table at the front and at the sides.



*Figure 91.* Chair back with cut-out table, placed over ordinary roller for use where the child has some sitting balance, permitting slight sideways movement of the child while sitting.



*Figure 92.* A cut-out table can be attached to the triangle chair, for the child who cannot overcome the resistance sufficiently at his hips to bring his arms forward to play on the floor.

As with any other position, the child should not remain in a hammock for too lengthy a period.

If a child is only moderately handicapped, that is to say if he is not so stiff, he will have the ability to balance and use his hands when sitting, but he should still only be allowed to remain on a chair for a limited time. Whenever possible the child should be encouraged to move around while he plays.

The following may provide useful alternatives to enable the cerebral palsied child to move around. Suggestions must of course be practicable if they are to be used in the child's home; factors such as the size of the room and the doors, the type of floor covering and





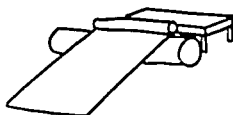
(a)



(b)



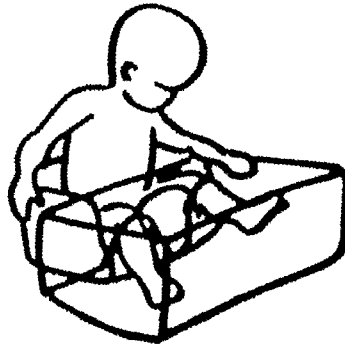
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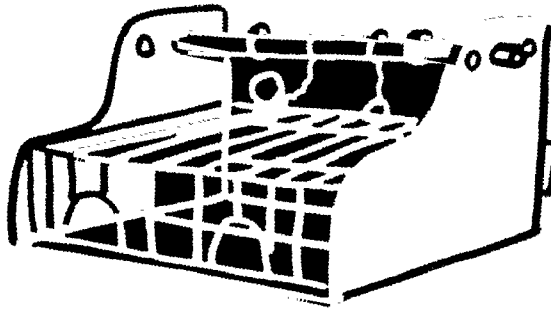
(d)

**Figure 96** Various ways of enabling a child to play on his tummy. *Note* that the hips and legs are left free, it is important that the child is able to *move* in this position

- (a) A bolster, with webbing support for the child who rolls over immediately he is placed on his tummy
- (b) Playing over a roller placed under the chest is adequate for some children *but* where the child's legs become very stiff and turn in as a result of the stimulation of using his hands for play he can be helped further by placing him on another roller as illustrated. In such a case he will need your help, if you move the roller he is lying on while he plays you will prevent him becoming stiff and you will also activate his back, in effect you will be treating him while he plays.
- (c) A sloping board helps some children to keep their head up while lying on their tummy and makes it easier for them to use their hands and look at what they are doing
- (d) A variation of the sloping board, the small roller helps to keep the child's shoulders forward and up. The stool or box should vary in height according to the needs of the child



*Figure 94.* Table and chair fitted together for play. We use these packing cases as a temporary measure for very young children, as they are very cheap and easily adaptable.



*Figure 95.* Athetoid children find it difficult to handle their toys, which frequently 'fly away' from them. Where a tray with a deep side is not adequate, we have found that attaching the toys to a bar is useful.

The idea illustrated was made by a parent for his daughter, an athetoid, to play sitting on the floor. The sides are wood, the base hardboard, a piece of wood at the back joins the sides to make them more secure. Having three holes at the top of each side enables the bar to be placed near or far away from the child as required. The wireless case acts as a table. This could be modified to fit onto a table for a larger child if required.



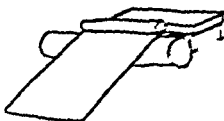
(a)



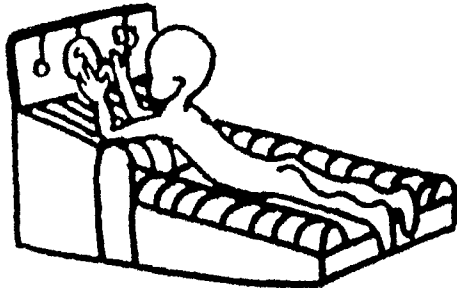
(b)



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(d)



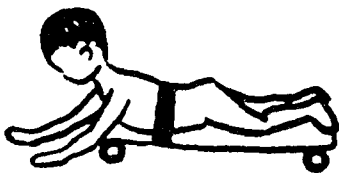
(c)

(c) Another adaptation of the sloping board. A board or piece of foam rubber cut into a wedge (these can now be purchased) long enough to allow the child's feet to hang over the edge as illustrated. The sides are built up leaving room for the child to move but preventing him from falling off. A roll is placed in the front as in sketch (d).

As some children find it difficult to bend their arms when lying on their tummies, we have sloped the top of the box. This we find helps considerably.



*Figure 97.* For the child who has good arms and moves around the floor by "bunny-hopping" and is not old enough to ride a tricycle. This is a modification of the roller seat, Fig. 83. The child has to move his legs to push himself around, the roller helps to keep them apart and turned out. The funnel keeps the arms up and apart.

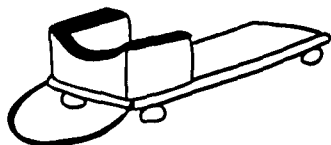


*Figure 98.* For the young spastic diplegic child who normally creeps on the floor as described in Chapter 2, Fig. 13 (a). A simple wooden board 2 in. thick with four 'Shepherds' casters; this will encourage the child to move around pushing with straight arms. For the very young child whose legs are not stiff the only support he may need is a band around his body as illustrated.



dressing, they can have their clothes within easy reach beside them. They feel safe with their feet on the ground, and when they have to stand up and sit down, can do so without fear of falling over.

Although excellent for normal babies we do not recommend the 'Infantseat' chair for cerebral palsied children, because the back of the chair is tilted backwards making it impossible for the child to bend his hips and therefore bring his arms forward. Also the seat is too short, and the angle of the chair—especially for children who are inclined to push back—reinforces any spasticity. Furthermore, the head is supported by the long back of the chair and this gives no opportunity for the child to achieve head control when sitting in it.

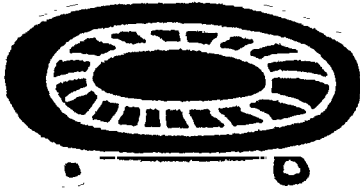


*Figure 99* This board is suitable for an athetoid child, his legs in this case can be free to move. Note that the front is raised higher than in Fig. 100 to counteract his greater difficulty in lifting his head and keeping his arms straight. If the child's tendency in this position is for his head to fall back

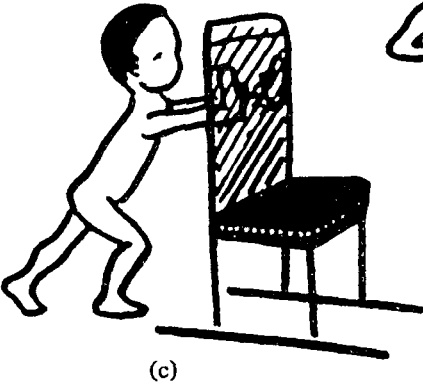
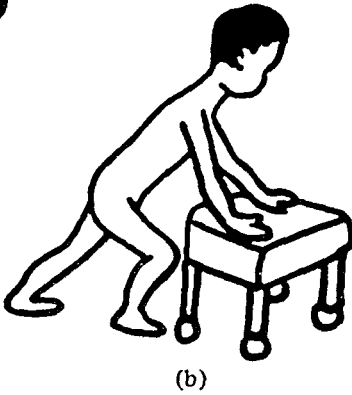
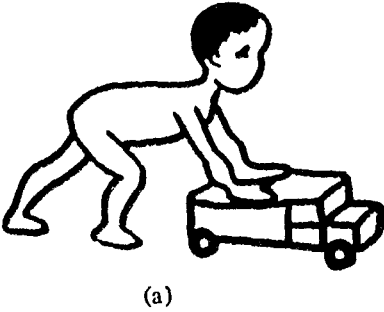




*Figure 101.* A small scooped-out stool with 'Shepherd's' casters for the child who has 'weak' rather than spastic legs to encourage him to use them and not his arms to push himself around.



*Figure 102.* Modification of the roller board; a wheel with rubber tyre. These can be bought from most stores.



*Figure 103.* Illustrates objects that the child can push with open hands; he may hold the chair at the sides but will still not grasp with his fingers.  
*Note.* The height of the object is important and is chosen according to the amount of flexion at the hips we want with each child.

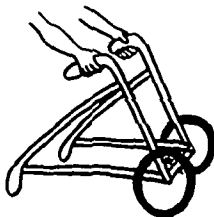


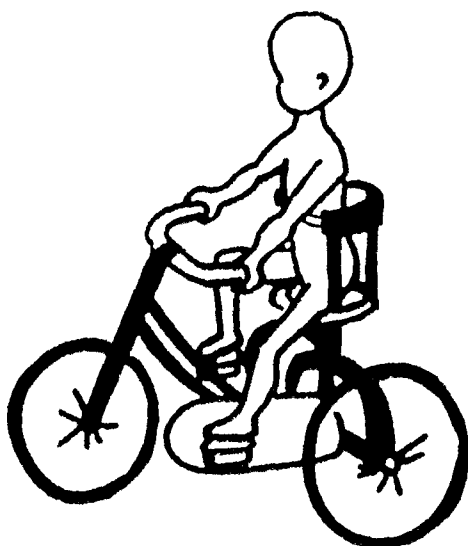
Figure 104. A large wooden box can make a good home-made walker, the additional stability will give resistance and make it easier for the athetoid and ataxic child to push. Wooden skids can be added to make it simpler to push over carpets.



Figure 105 The best type of baby walker for the cerebral palsied child with building blocks which are placed in the front of the handle and cannot

This type of handle also helps the hemiplegic child





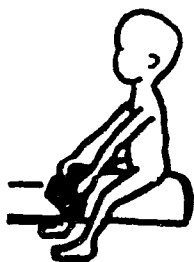
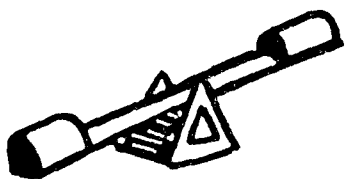
*Figure 107. Tricycle.*

Wide high *handle bars* will keep the child's arms and hands well apart; as we mention earlier this position of the arms will also help to keep the legs apart. If he is still inclined to turn his legs in and pull them together, use a roll of foam rubber placed between the thighs *not* the knees.

Suggestion for a seat back, this can be made of wood, or, by cutting a plastic bucket in half and padding it, leaving a little of base of bucket attached so that it can be fixed onto tricycle seat. *Wooden blocks* are used to prevent the pedals from turning around.

There are many ways of attaching the child's feet to the pedals if necessary, such as straps, toe caps on pedals, shoes fitted onto the pedals and so on.

Immediately your child has good balance and control when riding his tricycle, remove any unnecessary adaptations.

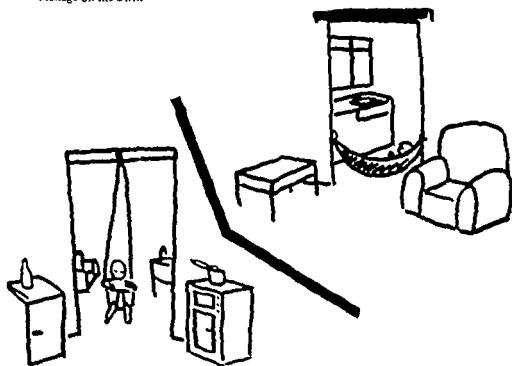


*Figure 108. Children who tend to turn their legs in sometimes find difficulty in sitting on a see-saw. By adding half a roller on to the end, the legs can be kept apart and the child finds it easier to hold on with straight arms.*



*Figure 109.* Two poles with a rubber tip are ideal for the child who has some standing balance and is starting to walk on his own. While they provide some support he will be unable to lean on them and therefore has to work to remain upright.

Start by holding the top of the sticks but as soon as possible, let the child manage on his own.



## SLEEPING

### The cot or bed

Why is the position of the cot or bed so important? You may have noticed that when the cerebral palsied child is lying on his back he has great difficulty in keeping his head in midline, and that he may also have a tendency to turn his head more to one side than to the other. This could, in time, result in deformity of spine and hips. The hip on the opposite side from which the head is turned tends to turn in. We shall illustrate this difficulty by assuming that the child always turns his head to his right side. Fig. 111, page 139, and Fig. 112, page 139, illustrate the incorrect position in the cot or bed for such a child; it will be seen that the blank wall is on the left side of the child; all the stimulation, therefore, comes from the right and there is no incentive for the child to look to the left. He will be picked up, spoken to, and have his toys brought to him from the right. The position of the window, the electric light and people moving in the room will all reinforce his desire to turn to the right and increase his tendency to do so. The door in our illustration is behind the child which will make him look back when it is opened; a movement often combined with the turning of the head to the side in a cerebral palsied child.

Fig. 113, page 140, illustrates the correct position in the cot or bed for such a child. All stimulation now comes from the left, the side to which we want to encourage him to turn. The position of the door makes it necessary for him to lift and bend his head forward if he is to see who is coming through the door.

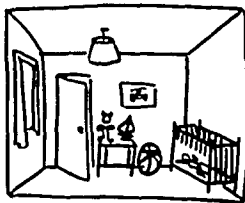
The sketches stress the importance of the position of your child's bed in relation to the room and of taking into consideration his own particular difficulties before deciding where to place his bed or cot.

We all move in bed, even while we are asleep, and adjust our positions repeatedly during the night. The child should get used to lying in various positions even if he is slightly uncomfortable at first. To begin with he should be helped to move from one position to another and be taught gradually to move and adjust himself in bed. We do not suggest that you should put the child to sleep in a position which, although good for him, is uncomfortable, as he will be unable to sleep and will immediately fall back to his usual position. He should first be accustomed to various changes of position *during the day*.

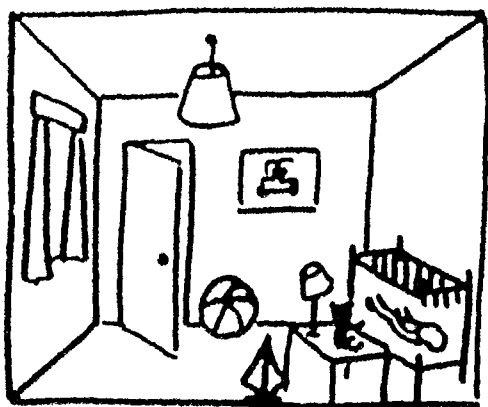
In the case mentioned where the child looks predominantly to the right, gradually get him used to lying on his left side during the day, and in time get him to play on his left side. When placing him on his side start by getting his shoulder and arm well forward; this will make it easier for him to turn his head, and in some cases the child will then be able to turn his head to the side himself (Fig. 114, page 140). Only when he has learned to adjust himself comfortably to this position can we expect him to sleep in this way.



*Figure 111* The child turns his head predominantly to the right. Note the bending of the arm, shortening of the trunk on the left side and the turning in of the left hip.

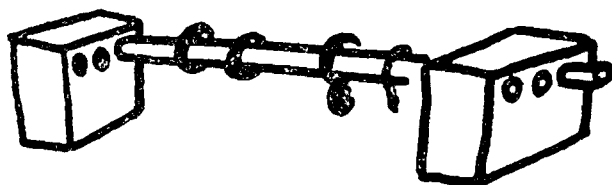
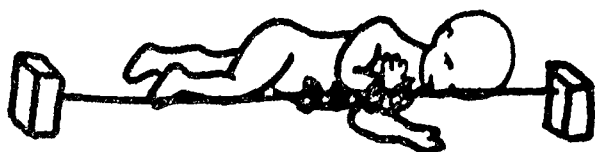


*Figure 112.* The *incorrect* position in a cot or bed for a child who predominantly turns his head to the right.  
*Note* All stimulation comes from the right, the window, electric light, position of toys and so on. Only the wall is on the left side; he has no incentive to turn in this direction.



*Figure 113.* The *correct* position in a cot or bed for a child who predominantly turns his head to the right.

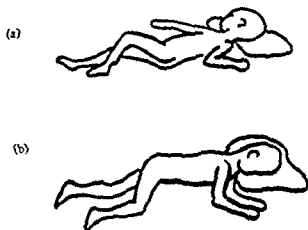
*Note:* All stimulation now comes from the left, encouraging the child to turn this way; the only thing on his right is the wall.



*Figure 114.* When the child can lie comfortably on his side, encourage him to play in this position. Suspending his toys, will make it easier for him to handle them. Illustrated above is a broom-handle which can be fixed to a couple of plastic or wooden bricks. Stops on the stick will regulate the distance to which the child can move his toys up or down.



If a child can only lie on his back he can at least be partially helped by wrapping a shawl or blanket firmly around his shoulders, keeping the shoulders and arms forward and inside; though in the case of an older child forearms should be left free. This should help to counteract the pushing back of the head and its effect on the whole body. It must be remembered that this is a form of 'outside' aid and as such is opposed to our objective of getting the child to move independently. While this method may be useful temporarily, it should not be



*Figure 115*

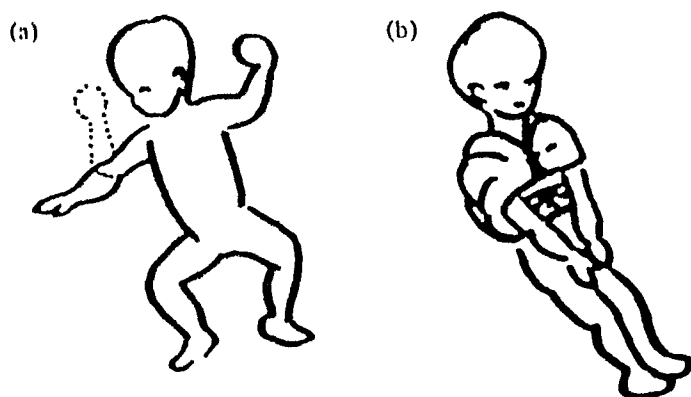
- (a) *Habitual position of some children when lying on their backs. The excessive turning out of the under leg, causes the pelvis to be pulled over, and the other hip and leg to turn in.*  
 (b) *By lying on the opposite side, the position of pelvis, hips and legs are corrected.*

used permanently. The tightness of the shawl or blanket should be lessened gradually in the hope that it can finally be discarded, and that the child will be able to sleep in various positions as described above.

Some children have a tendency to turn in one of their legs when lying on their backs which brings the hip forward on that side. In such a case the child should be placed down on the side on which the leg turns in (see Figs. 115 (a) and (b), page 141).

Many young athetoid children lie on their backs with their legs in a 'frog-like' position (see Fig. 116 (a), page 142). Placing a shawl around the child's shoulders and arms to bring them well forward (Fig. 116 (b), page 142), tends to bring the legs together and reduces the excessive kicking of some of these children.

There are other children who, when lying on their backs, bring their shoulders and arms forward; some of them tend to bend at their hips and knees when they are sleeping and become very stiff in this position with the danger, in time, of the development of contractures at hips and knees. As soon as this type of child has learned to lie on his tummy during the day and is able to lift and turn his head when in this position, he should sleep this way but without a pillow. It must be stressed that before allowing him to sleep on his tummy, he must have sufficient head control to *lift* his head in this position. If the child can



*Figure 116*

(a) Athetoid child lying on his back—legs in a “frog-like” position. The legs are turned so far out that the knees lie flat on the bed. The head and shoulders pull back. Two typical arm positions are illustrated.

(b) A nappy is used to control and bring forward the shoulders and arms of an athetoid baby.

*Top* two corners of the nappy are brought over the shoulders and tied over the chest.

*Bottom* two corners are brought forward under the arms and tied around the waist.

*Note:* Elbows and forearms are left free. This support may help to stop the excessive bending and parting of the legs and stop the kicking that many athetoid children do when lying on their backs.

*only turn* his head to one side it will be seen that the spine is curved and the whole of the trunk is turned and pushed on one side; this may give the impression that the child is lying on his tummy whereas, in fact, he is not. Generally speaking sleeping on the tummy should be confined to the day-time as this makes supervision easier, or perhaps when the child is first put to sleep at night and he can still be watched.

Night-time presents the parents of cerebral palsied children with some of their hardest trials. Many of these children are poor sleepers, which is understandable, as they use very little energy during the day; and spastic children who are unable to move in bed get very stiff and

uncomfortable. Whilst the spastic and the 'floppy' child seldom move during sleep and need to be moved and turned frequently during the night, most athetoid children can move and are relaxed during sleep.

If you have ever slept on a soft feather mattress and tried to turn over, you can imagine some of the difficulties with which a spastic child is faced when trying to move in bed. By placing a hard board under the length of the mattress a firm surface is provided, so making it easier for the child to roll over and adjust his position.

Some athetoid children move so frequently in bed that it is difficult to keep them covered. A warm roomy sleeping bag with sleeves will be found very useful for them; or tapes sewn to the four corners of the blankets and tied under the bed.



*Figure 117* Simple ways of keeping the weight of the blankets off the child's legs and feet. Many supports are easily obtainable in large stores.

Pillows should be firm and used only for children who push back their head when lying on their back. These are usually the athetoid children, or the spastic children in whom both the arms and the legs are affected

Light warm blankets should be used, as heavy blankets add to the child's difficulties in moving. Some spastic children dislike having their blankets tucked in and can move their legs more easily if they sleep in the type of sleeping bag mentioned already in the case of athetoids. In Fig 117, page 143, one of the many methods by which the weight of bedclothes on the feet can be reduced is illustrated.

The cerebral palsied child should be moved from a cot to a child's bed preferably at the same age as a normal child is moved. Many normal children have a fear of rolling out of bed, especially when they first move from a cot to a bed, but even more so the cerebral palsied child. This fear will be lessened by use of a very low bed; it is also a good idea to stand a solid chair against the bed.

Patience and constant training are essential if the cerebral palsied child is to be able to approach independence in bed, turning himself, covering and uncovering himself, and getting in and out of bed on his

own. Start training him as soon as he is capable of doing the movements needed, and persevere. He needs to be taught what to do and to have plenty of practice, or he will not acquire those simple 'skills' which a normal child acquires almost automatically. For instance, help him to learn the sequences of movement he will need as you play on the floor with him. For example, cover him with a blanket and, in the form of a game, despite the weight of the blanket, ask him to cover and uncover himself and move about under the blanket, and so on.

We have found that where there are other children in the family, the cerebral palsied child will often behave better and sleep more easily if he is moved into the same room as the other children.

In cases of persistent sleeplessness and restlessness it is advisable to consult your doctor rather than worry yourself as a result of the failure of numerous expedients.

## PLAY

### The normal child

It is largely through play that a child learns. One of the first steps in this process of learning is that he becomes aware of himself. Having become aware of himself, he is then ready to explore and learn about others in relation to himself, for example, to touch and point to his mother's face, eyes and mouth. In time when we ask him 'where is my nose?' 'where is your mouth?' he will point and touch; he then goes a step further and learns the names of the parts which he touches. Later he can explain, 'my mouth is under my nose', 'my ears are at the side of my head'. As his field of recognition widens, he uses and relates what he has learned to his dolls and toys. Later, as he crawls and moves about he becomes aware of himself in space and discovers that there are two sides to his body; that his head is at the top and his feet at the bottom; that his chest and tummy are in front, and his back and bottom are at the back. He later makes use of such information as he starts to feed, wash and dress himself.

A child also has to learn and to understand how the world around him works. He learns as he plays to differentiate between shapes and textures. This he does when he starts to take things to his mouth. He learns also to differentiate between sizes, weights, colours and so forth; how to manipulate objects and to assess the amount of effort needed for a desired result. He learns how things fit into one another, or how they can be screwed or unscrewed, squeezed, pushed, or pulled. By exploring objects he learns to understand where are the top, bottom, sides, the inside and outside of objects. He learns to perceive and calculate distance, how far he has to reach out before he can get hold of and pick up his toys, the width and height of things and their relationship to one another. In learning what he can and cannot do with things around him—his environment—he learns to rattle toys, to bang, to throw, to build. He also realises that some things are good to taste and smell and that others are unpleasant.

Learning while playing extends to climbing in and out, up and down, under, over and around objects, finding out the space through which he can squeeze, what heights are dangerous to jump from and what can be safely managed.

All this, and more besides, *the child learns while he plays*, becoming more skilful as he grows older, doing more and more for himself, asking questions and practising and learning from his mistakes.

### **The normal baby**

If you watch a normal baby while he plays, one thing will immediately strike you—he is never still and he is seldom silent, though to begin with he just gurgles and babbles as he plays. A baby lying on his back and playing with his toys continually kicks his legs and wriggles about. When he is able to lie on his tummy, he is just as active. Interspersed with his play, he rocks on his tummy, lifting and waving his arms about as he kicks his legs. He pivots on his tummy, rolls over on his back still clutching his toys and taking them to his mouth. As he acquires balance and control in sitting, in upright kneeling and in crawling, he moves continually from one position to another as he plays with his toys.

In this way, besides practising new patterns of movement, the baby learns about himself in space and about his relationship to things around him. Later he tries to grasp a toy that is out of reach and realises that he must move towards it. A ball rolls under a chair and he has to work out how to get it. He climbs on to a chair to get a toy and has to decide which is the best way of getting down without dropping it. He bumps his pushcart into the furniture until he realises that the furniture is solid and he must find his way around it. He discovers that some things go faster if pushed, others if pulled.

### **The cerebral palsied child**

Play is equally important for the cerebral palsied child. He, too, must become aware of himself, explore and get to know his hands, face, feet and so forth; learn about himself in relation to others, and understand how the world around him works. Because of his difficulties, in moving and balancing, in eye-hand co-ordination—and often with the additional handicap of defects in hearing and seeing—he needs a lot of help. Owing to his difficulty in listening, in looking at what he is doing, in touching, holding and manipulating objects, his progress will be slow and he will need considerable understanding and guidance. His span of concentration and his ability to remember are often of short duration. His handicap prevents him from learning through play in a natural way, so, unless he has help and encouragement, he will not be able to learn as he plays or to reach his potential.

The severely handicapped or very young cerebral palsied child, i.e. the child who cannot play on his own

How can we help the *severely handicapped* child, who is restricted in his movements and has no sitting balance, to use his hands for play? We should first try to analyse his difficulties and find positions which will enable him to use his hands to the best advantage, that will be easiest for eye-hand co-ordination and will present the least difficulties for balance. He is at his best when lying on his side—or on his tummy. Lying flat on the floor is not satisfactory. Even a normal person soon finds this position uncomfortable, and especially tiring if at the same time trying to do something with his hands. The sketches in Chapter 8, Figs. 96 (a)–(e), show how with the use of a roller, bolster or sloping board, the child can adapt himself to lying on his tummy, making it possible for him to keep his head up and his back straight, to bring his arms forward, and to start to use his hands.

Here are some points to remember when deciding on a good position for play:

- (1) The child should not remain in any one position for more than twenty minutes.
- (2) A variety of positions should be tried before deciding which is the best. It is not necessary to keep to the same position each day, for his problems, although basically the same will vary to some degree. What was good yesterday may not be so good today. For example, some days when lying on his tummy he may keep turning his head too far to the side and roll onto his back. For this you may need to give him extra support at the side of his chest, or make some adaptations that will keep his shoulders and arms forward. It is important that you notice these changes or the child who is unable to use his hands may become frustrated and cease to make any effort to use them.
- (3) Although a normal baby first plays when lying on his back, this position is usually the worst for a cerebral palsied child. Some children cannot get their shoulders and arms forward and are therefore unable to put their hands together. Others may be able to get their arms forward only to hold them tightly over the chest, bent at the elbows and with hands clenched which they are unable to open to reach out for a toy. Many children who are so handicapped when on their backs are also unable to lift their heads when lying on their tummies, even when well supported. Fig. 118, page 148, shows how, by having the child on your lap you can get him accustomed to lying on his tummy while you control his head and keep his shoulders

and arms forward. Directly you feel that he is trying to control his head himself, be sure to take your hands gently away. Some children find it easier to lie with their arms straight; others with them bent taking weight on their elbows. Try both ways, as the child will eventually have to manage with his arms forward in all positions and to take weight on them.

When the child has achieved some sitting balance the chairs and tables described in Chapter 8 can be tried and adapted.

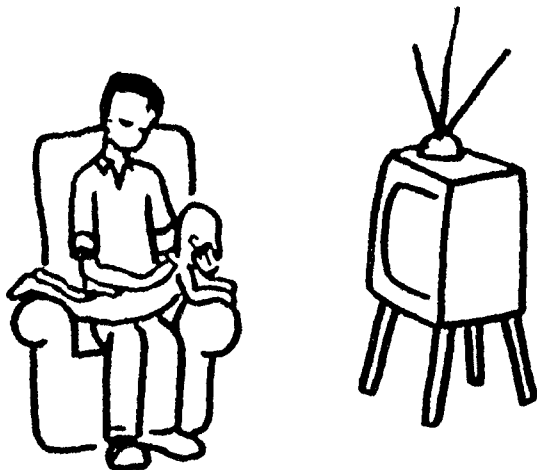


Figure 118. The child lies on his tummy supporting himself on his arms. His mother helps him to straighten his back and gives light pressure under the child's chin to enable him to hold his head up.

### First steps in helping the child to play

During the first two years an important part of play is by imitation both of sounds and movements—saying ‘bye-bye’, clapping hands, playing ‘pat-a-cake’, looking into a mirror and touching it, playing ‘peep-bo’, and so on. Help the child with the various gestures, repeating the simple phrases for him, and be sure that he can both see what he is doing and hear what you are saying. Later use such rhymes as, ‘This is the way we wash our hands’, and ‘Simon says do this, Simon says do that’, which teach him not only to move but also to learn the names of parts of his body. Use phrases that describe everyday activities, and encourage him to repeat the rhymes with you. His span of concentration will be very short at first so repeat a few actions and phrases for *short* periods until he really becomes familiar with them.



At this stage the child will discover that he can make new sounds. Encourage him to repeat them by copying him. A good way of making this into a game is by joining together two hollow cardboard cylinders with a piece of string, making them into a telephone. If you cover one end with wax paper, you will find that the sounds will be magnified (see Fig. 119, page 149).

### Helping him to use his hands

If you look again at the sketches on Chapter 2, Figs 21 (a)-(g), you will notice how the abnormal postures of the cerebral palsied child make it impossible for him to bring his arms forward with hands together, or to bring his hands towards his body with the palms facing him. In some cases the hands are permanently closed, or else they close only when the head is turned away from the arm, thereby making it impossible for him to look at his hand. In other cases the hands are permanently open, or else open directly the arm is lifted.

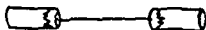


Figure 119 To make a toy telephone, take two cardboard cylinders (as found in kitchen paper rolls, etc.), cover one end with paraffin wax paper and join them with a piece of string or cotton.

To use our hands adequately we must be able to hold the head steady. This enables us to look at what we are doing and to open our hands to grasp and release regardless of the position of the arms. It is a waste of time to place a toy into the hand of a child who has no head control and who is unable to release, and expect him to play with it.

A normal baby spends many hours just looking at his hands, moving them in front of his face, bringing them together and feeling them, putting them to his mouth and so on, before he learns to use them purposefully; the length of time he continues to do this is an indication of the importance this kind of hand play has in his development. A first step with the cerebral palsied child, is to help him to become aware of his hands, making it possible for him to feel, grasp and release, before giving him actual objects to handle. The importance of a good position of head, trunk control and, particularly, of good control at the shoulders to enable him to use his hands, has been described in earlier chapters. Helping the child to learn about his own face and body, an important link for future play, is described in Chapter 11.

In addition to the suggestions made in Chapter 11, the following ideas can be tried to help the child become 'aware' of his hands.

- (1) Shine a torch, preferably one with different colours, over his hands and through his fingers. Draw his attention to the various patterns and shadows his hands and fingers make on a wall or table.
- (2) Wind a piece of rough string through his fingers, leaving two long loose ends to encourage him to pull it.
- (3) Use different coloured thimbles to attract his attention to his fingers, getting him to bang and to scratch a flat surface.
- (4) Draw a face on the palms and the backs of his hands.

**When he is able to use his hands a little, try the following suggestions:**

- (1) Place the child's hand in a jar filled with rice, lentils, beans, macaroni, loaf sugar, and let him move it around as he wishes, encouraging him to take the contents in and out of the jar.
- (2) The same objects can be placed on a tray and you can get him to sweep them to the top, bottom or sides of the tray. Be sure to make him aware, as you play with him, that his hands are moving from side to side, up and down, or in the middle of the tray; if possible get him to repeat or say with you the direction in which he is moving his hands.
- (3) Place his hands inside a paper bag full of well-defined objects that are known to him and then let him play as he wishes. In many cases just to feel and move the things around is achievement and a process of learning.
- (4) Slowly and repeatedly rub his hands, including his fingers, over different surfaces, using everyday objects such as fruit, bread, household objects and so on, till he feels the whole object in his hands and becomes aware of the texture, contour and edges. Always name the objects, their shape, colour and the way they feel as he handles them. He must become aware of the object as a *whole* before he can appreciate the individual parts and their relationship to one another. This is often very difficult for the cerebral palsied child.
- (5) Place his fingers into salt, sugar, jam, or around a bowl that has held cream, custard or a mixture that he likes. The severely handicapped child can only enjoy these experiences of feeling, smelling and tasting if objects are brought and introduced to him. If it should be snowing, for example, even bring in a bucket of snow for him to handle.

Playing and learning here are synonymous. Give him as wide a range of experience as you can, including the stimulation of feeling, seeing and listening, and encourage him all the time to express himself by gesture and, whenever possible, of course, by speech.

Playing with your child should not be a special half-hour session a day but should be included in the daily routine. Make use of the things that are around you: food when you are both in the kitchen; household objects as you clean the house; things in the bathroom when you are in there. Let him look into the cupboards; help him open drawers and explore their contents with you.

If your child had been able to move about, this is how he would have played at this stage: investigating into and enquiring about the things that are familiar to him and in everyday use around him—joining in with your activities throughout the day.

#### **The moderately affected child or the child who is beginning to play by himself**

The normal child learns by trial and error—as he plays, he experiments. If the cerebral palsied child is to learn in the same way, it is essential that the games played with him and the objects given him are *very simple to begin with*. If the slightest accidental movement on his part makes an object move or even makes a noise, he will have made something happen *himself* and this will stimulate him to try again, experimenting on his own, not directed to do so. He will have started to learn.

The following we have found useful for simple play

- (1) A large basin of water (in the summer it is better still to put him into the water). See that the objects he has to play with are as varied as possible. Heavy ones that sink, light ones that float; things that will make a noise when he bangs them together. Later on, a plastic jug, 'squeezey' bottle, funnel, or a colander, all giving a different effect as he takes them in and out of the water. Point out the differences between the objects and the various ways the water pours out of them.

When playing with a hemiplegic child, we have sometimes made the water cloudy in order to stimulate his interest and, in this way, get him to use his affected hand automatically.

- (2) Paper is another simple but enjoyable material for children. A tissue square can safely be placed over a child's face to encourage him to blow, or to remove it with his hands. Tissue paper can be made into a ball and pushed up his sleeve or down his vest; it will scratch and

make a noise and automatically he will try to see what it is and put up his hands to remove it. All children love balls and paper makes the lightest and safest ball. Hiding a favourite toy in a loose parcel of paper, looking through a hole made in paper, wrapping him up in paper, all provide amusement that is sometimes within the capabilities even of the severely handicapped child.

- (3) Play-dough or play-foam spread on a mirror; talcum powder on a dark tray; finger paints; a sand pit, preferably not on legs so that he can actually get inside it, and so forth, are good ways of enabling the child who has little ability, to use his hands and to achieve results, while he plays. A child who seems to have no interest in toys or in playing with objects around him can sometimes be encouraged at least to look at or move them away if they are piled on his lap or or if he is made to sit on them.

### **The young cerebral palsied child who has the ability to balance and to move**

This type of child should not play only when sitting in a chair. If he does he will miss the chance of gaining many new experiences. By moving around when at play he will make use of new patterns of movement and acquire new experiences and skill. For example, if he has learned to move from sitting to kneeling upright, place his toys in such a way that he can practise a sequence of movements. The sketches listed at the end of this chapter show a variety of ways of encouraging the child to move as he plays (also included are illustrations of play with movement for the more handicapped child, who is still at the stage of being able to use his hands only when sitting), the child should play such games as 'London Bridge is falling down', 'Ring-a-ring of Roses', 'Oranges and Lemons', and 'Statues': games which will assist in teaching him the concept of 'up and down', 'round and round' and so on. Obstacle courses are a good way of teaching him to climb over and under, through, sideways and around objects. 'Hide and Seek' is also useful, while the copying of movements in such games as 'Simon says . . .', and getting him to roll over and crawl on verbal command, are all helpful.

It is very important at this stage for the child to become aware of the space that surrounds him as he plays. This should include the space behind him. Encourage him to move in different ways: backwards, forwards and sideways, crawling, upright kneeling and walking. Games that include throwing a bean-bag over his shoulder or passing a ball over his head, and guessing from a sound behind him what object you are holding, are all ways of encouraging this awareness. Miming to

nursery rhymes, conducting or moving to music; playing on see-saws, slides and swings, are ways of playing that will help a child to understand the relationship between space and his own constantly changing position.

### Choice of toys

The following are a few ideas for simple toys and for play. There are many pre-educational toys on the market: and such toys as tricycles, see-saws and so on that can be used only by the mildly handicapped child which have been omitted. Advice on the most suitable toys for a child, according to his age and ability, should be obtained from those concerned with his teaching. No attempt has been made to state any particular age group as so much depends on the ability of the individual child to use his hands, as well as his level of intelligence, and powers of concentration and comprehension. It is always best to ask the therapists for advice when choosing toys, for in this way you may avoid causing frustration to the child by giving him something too difficult to manage, or else too simple to be a challenge and therefore lacking in interest.

- (1) All children love *balls*. When choosing a ball bear in mind the variety in size, texture and colour that there are; that some are soft and others hard; some have stories in picture-form on them while others play a tune. A heavy ball, for example, is easier for the ataxic and the athetoid children to play with as *their movements* are so disorganised and clumsy that the ball otherwise is apt to roll away. A spastic child, on the other hand, can play best with a smaller solid ball as his grip is apt to be too firm and he will have difficulty in lifting a heavy ball. A hemiplegic child should play with a large beach ball to encourage him to use both hands *together*. When the child can only grasp a bat or a stick, a ball attached by elastic enables him to play *with the ball*. For the child who may want to throw and catch a ball but is unable to hold it, a bean bag can be used *instead of a ball*; this is easy to make and can be made of bright washable material.
- (2) Large wooden light-weight bricks can be used for other games as well as building, i.e. place in plastic bags, insert coloured or numbered cards and use for matching or grouping. Bricks are easier to handle *than the cards themselves*.
- (3) *Self-righting toys* are good for the athetoid child with poor eye-hand control. These can be bought in all sizes, either solid or inflatable.

- (4) If a child has difficulty in playing with his toy cars because he cannot hold on to them, he may manage better if the car is attached to a stick.
- (5) If you give a child a toy that requires winding up to make it move try whenever possible to adapt the key so that he can wind it for himself.

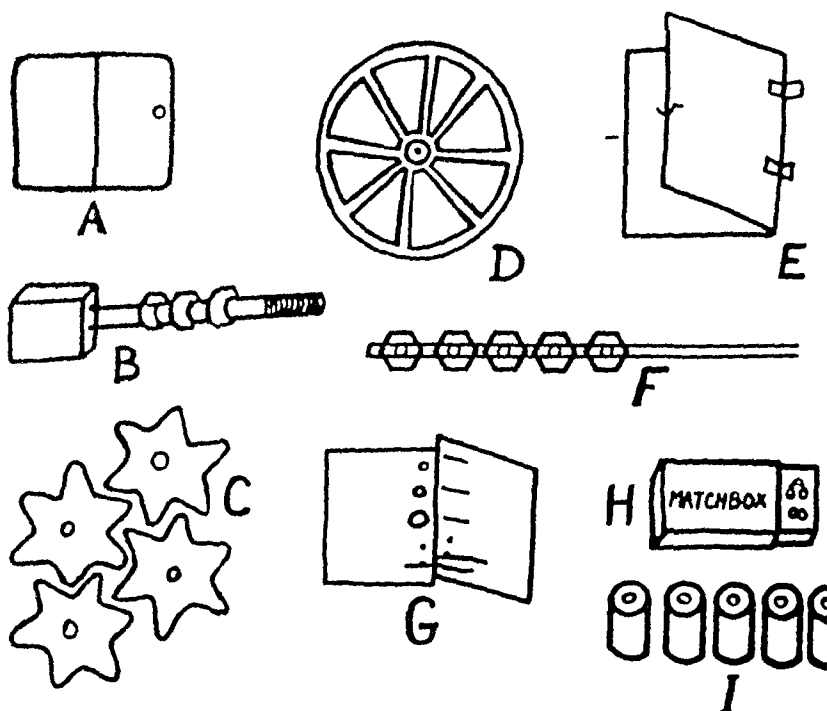


Figure 120. Home-made busy-box.

- A. Sliding door—on small runners with a picture behind the door, which the child sees when the door opens.  
Picture behind to see when open.  
Large knob on door.
- B. Large bolt mounted horizontally on block. Nuts to screw on.
- C. Cog-wheel board. Wooden cogs mounted on pegs—may be removed.
- D. Wheel—may be cut like a telephone dial.
- E. Hinged door—with hook fastening.
- F. Coloured nuts, bolted together from behind. Slide along slot in board.
- G. Material with different sized buttons and buttonholes, and cords to tie bows.
- H. Matchbox stuck onto board.
- I. Cotton reels to fit on pegs painted in corresponding colours.

- (6) A doll's house made out of large wooden boxes is best for the cerebral palsied child, as the rooms will be big enough for him to put his hands inside, and by using larger 'furniture' he will find it easier to move the objects about.

- (7) A toy popular with most children is a 'busy-box'. For the cerebral palsied child a home-made 'busy-box' can be made on a larger scale and designed specially to suit his needs (see Fig. 120 page 154).
- (8) Coloured cotton reels make excellent counters and can be easily fitted over a board of wooden pegs.
- (9) Small empty plastic bottles can be used for guessing games and are a useful size for the child to hold. Fill them with different things to smell and taste, of varying weights and sounds. 'Squeezy' bottles can also be used as a home-made set of skittles.
- (10) Most children love music. Listening to the radio or record player is fine but it is far better to encourage them to make their own music. For the child who finds it difficult to blow because he cannot close his lips or immediately bites anything placed into his mouth, and for the child who breathes in a 'shallow' or irregular way, the blowing of bubbles could be encouraged, at first through the wire supplied with the bubble fluid, and then through a bubble pipe. The child may then be able to progress enough to blow a recorder. Severely handicapped children who cannot hold a stick to bang a drum or cannot bang it with their hands, can make a satisfactory noise if a piece of elastic is tied over the top and bottom of the drum. 'Squeezy' bottles filled with sand, buttons, dried peas, etc. can give a variety of sound effects when shaken. Bracelets for the wrists and ankles can be made of leather, and small bells sewn securely onto them, this is a good way to encourage music and movement at the same time.
- (11) Encourage your child to keep a scrap book. Begin with a room in the house, perhaps, the kitchen. First show and talk to him about the various things found in a kitchen. Then, with him, see if you can spot them in a magazine or paper, and cut them out and paste them into a scrap-book. You can enlarge on this idea when you go out for a walk together collecting leaves, flowers and so on, and pressing them in his book. When he is beginning to discover that objects have a shape, i.e. round, square, triangular, oblong; collect these with him and then find pictures of them to cut out. Later, the child will get to the stage of copying and drawing the various objects for himself. In this way he will not only learn the names of objects around him but also what they are used for, why they are made in a certain shape, the different colours in which they are made, and so on.
- (12) Books should be carefully chosen. It is all right to show a year-old child an adult magazine for his only interest at this time is to enjoy

the masses of colour on the page. When he begins to recognise objects, give him first a simple book with one picture to a page. As many cerebral palsied children have great difficulty in distinguishing background from foreground in a picture and sometimes reverse them, they need clear colours and outlines to the pictures with no unnecessary details.

- (13) In addition to the toys bought for him, the child usually gets great pleasure in playing with the odds and ends he finds around the house or that he collects in the garden or on his walks. All children are great collectors and hoarders, and if they cannot walk or move around the house they are not only denied the pleasure of exploring and finding out things for themselves, but also of acquiring a private collection of their own. It is up to us when the child is severely handicapped, to take him out to explore his surroundings or bring things to him so that he can find out all about them and keep those he particularly likes.
- (14) Poor or clumsy co-ordination of the child's arms, hands and fingers often makes it difficult for him to hold his toys and at the same time to move them around. The simplest way to overcome this is to provide some form of suspension for his toys. For the baby, small articles can be threaded on a piece of elastic which can be fastened across his pram or carry-cot; for the older child a bar can be used for heavier toys. The attachment over the table, as illustrated (Fig. 95, Chapter 8), is useful since both the distance and the height of the bar can be varied. A bar has been designed to fit across the elevated sides of the cots of normal children who are confined to bed and hanging short ropes on them so that the child can hook his toys upwards within his reach; these can be bought at Margery Abbot's, Wigmore Street, London, W.1, and provide a form of suspension that can easily be adapted for the cerebral palsied child. Be sure to put on the bar a variety of objects differing in weight, size, colour and texture. Toys that the child can safely put into his mouth may be used, *securely* attached to a long piece of string, so that he can gain the experience of feeling them with his lips, chewing and biting them.
- (15) When, at about two years of age, a child reaches the stage of building with bricks, he will begin by building perpendicularly, and at about two-and-a-half to three years of age he will progress to building horizontally. Empty yoghurt, food or cream cartons are simple to hold and are lighter than bricks, and may be easier for him to build with at first.



## Playing with your child

Many cerebral palsied children, including the less handicapped hemiplegic children have difficulty in concentrating and, in our efforts to improve their physical difficulties, we may interfere with and direct their play too much. We all tend to make the mistake, when a child is playing, say, with his bricks, of 'advising' him to 'try the small one on top of the large one', or, when he tries to take the lid off a jar, 'don't pull, turn the lid round and unscrew it'. Then again, as he attempts to push his large model car through a narrow tunnel, 'you will never manage that, try the little car'. The point stressed here is that a child will learn far more if he sees the large brick fall off, fails to get the lid off the jar by pulling or fails to push his big car through the tunnel. He should be allowed to make his own mistakes and to reason things out for himself. He will soon ask for help when he needs it. All this calls for patience. Some children can only manage to play for five minutes at a time, while others play the same game quite happily for twenty minutes. Try always to understand what new things your child is attempting to do and give him the appropriate materials and opportunities, helping him only when he is in real difficulty. It is most important that we should know and appreciate the maximum amount of concentration a child is capable of giving, for if we ask too much of him he will lose interest and cease to try. Lack of achievement will soon lead to boredom, he will return to the toys and games he knows and understands, and so be deprived of learning and gaining new experiences. The frustration tolerance of a cerebral palsied child is often low, and if he does not succeed at the second or third attempt, he gives up. This applies especially to the child of higher intelligence who *knows* what he wants to do, but cannot control his muscular reactions sufficiently to allow him to do it.

Children, until they reach the age of six or seven, are often easily distracted and it is difficult to hold their attention even for a short time; they soon tire of their toys or games and want to move to something else. With the cerebral palsied child this stage is often prolonged. Here are two suggestions that may help your child to concentrate. When giving him toys offer only two from which to choose, then put away the one he does not want. See that he is not surrounded by things that will distract him: an open toy cupboard, for instance, a pet or other activities going on in the room; playing by the window and so on. He will eventually, of course, have to get used to things going on around him without interruption of his play. When you give the child a new toy, show and explain to him exactly how it works, not once but many times. Stay with him, see if he can manage and that he understands what you have told him: you may find that he would perhaps play better in

another position: he may need help to enable him to use his hands, or to be supported to give him better balance. One has to remember that a normal child, although he can immediately pick up a new toy and play with it, also often needs quite a lot of help to understand how it works.

Far too often cerebral palsied children, lacking in experience and in imagination, never get past the stage, when playing with cars, for example, of lining them up and then returning them straight to their box, or pushing their trains around and around in the same direction. Help the child to use his imagination by building a garage for the cars so that he can pretend to fill them up with petrol and oil, to wash them and so on, as he may have seen the garage man do.

### **The play of the two-year-old normal child**

Between two and three years of age children, as well as playing with their toys, begin to be interested in all the things around the house. Anything that Mummy uses or does is fascinating and must be examined and tried. They continually watch and imitate their mother as they play: they want to polish with a duster; to stir with a spoon; to try and wash, dress and undress and take care of their dolls in the same way as their mother looks after them.

Play then becomes more complicated—dolls have tea parties, are put to bed, scolded and praised. If there is a new baby in the house, they are only too anxious to have a live 'doll' to play with if given a chance. When there are older children in the family they watch and copy them, listen to stories about school and enact the various episodes with their toys.

### **The play of the two to three-year-old Cerebral Palsied child**

The cerebral palsied child often has the same desire to explore, to find out how things around him work, and to copy and join in the activities of his mother, brothers and sisters, but his handicap prevents him from doing so. If he is to have a chance of enjoying these new experiences, he must be helped. If you are polishing and dusting, give him a duster: even the more severely handicapped child can polish for you as he sits in his chair. The ataxic child who walks in a rather disorganised manner, can help polish the floor if you wrap dusters over his shoes. This should help to improve the co-ordination of movement of his legs, and consequently his balance, as well as giving him pleasure in helping you. A child who drags the toes of his shoes when he walks can be put in charge of cleaning and polishing them; it may encourage him to try harder to lift his feet.

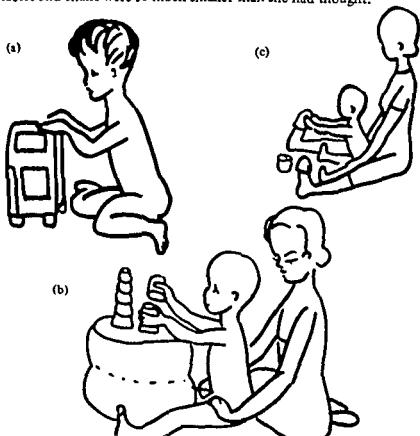


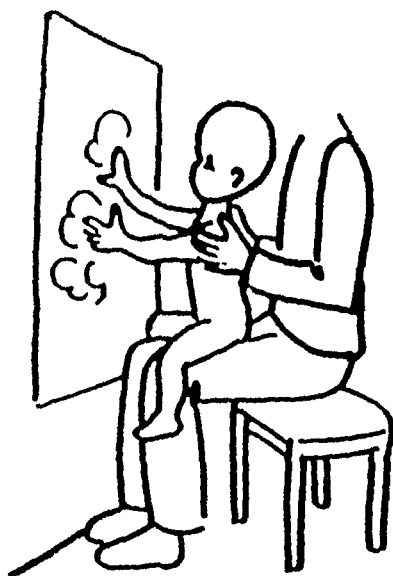
the round shape in a quoit or other ring and how this circle is a space through which he can see, pass things through, or place over objects. Then point out to him the same round shape in cups, lids, saucers, saucepans. When out for a walk collect some round stones; point out the round of the wheels of the cars and buses, the round flower beds in the park, and so forth. In this way he will learn to associate a particular shape with many objects, thus extending his awareness of things around him. Place a round sweet amongst some square toffees and invite him to find the round one. Later collect together a mixture of round and square objects and ask him to place them into two different groups; and then he should be encouraged to make the same shapes with his fingers in sand, flour, with finger paints, with a pencil or crayons. All this will be a gradual process taking time and patience, especially where the child has difficulty in using his hands. Continue to persevere, for the learning and understanding of shape is a *very important step* for many later skills, including reading and writing. Your occupational therapist will, of course, analyse the particular difficulties of your child and show you exactly how you can help him. Later, he will start to place shapes in a simple form board: to make this easier attach handles or knobs to the shapes. These should not be too large or they may distort the outline of the shape for the child. Begin by taking one shape at a time out of the board and letting him put it back; then take two, and when he has mastered the three shapes take them all out at once and let him replace them.

Some children find it difficult to grasp and lift an object but are ready nevertheless to learn about the concept of shape and form. A magnetic board is useful for such children: it can be placed flat on a table or propped up in any angle from the perpendicular to the horizontal or even attached to a peg board on the wall. The makers of magnetic boards also supply figures, letters, shapes and a variety of designs: these are easy for the child to handle as little effort is required to move them around the board.

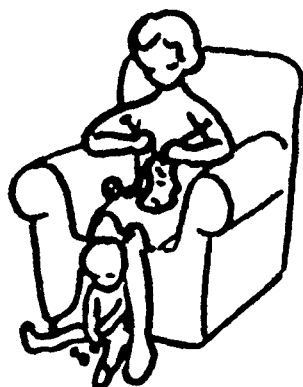
Between the age of three and four, your child may start to be interested in simple jig-saw puzzles. See that his first puzzles are clear, simple pictures with a well defined background and foreground. A picture with too much detail is only confusing for the child. Before he tries to do the puzzle let him really get to know the picture, then take one piece out and let him replace it immediately so that he becomes familiar with each shape. In this way it will be much easier for him to understand how each piece fits into the whole. The visual conception of shape is difficult for many children; the field of perception is a most specialised one and your child's occupational therapist, and later his

teachers who understand these problems, will give you expert advice on how to follow up his training. This will include learning how to distinguish between tall and short objects, a comparison which is often very difficult for the cerebral palsied child who spends so much of his time on the floor or sitting in a chair, and therefore builds up his conception of the size and height of things around him in a limited way. This point has been demonstrated to us even by a child of eleven who, when she stood up for the first time, was amazed to find that the refrigerator, tables and chairs were so much smaller than she had thought.





*Figure 122.* Child sitting astride his father's knee makes shapes out of play-foam on a mirror. His shoulders are lifted up and pressed forward to help him give pressure with his hands.

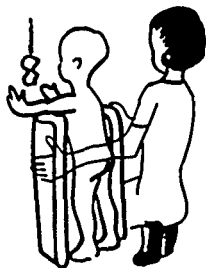


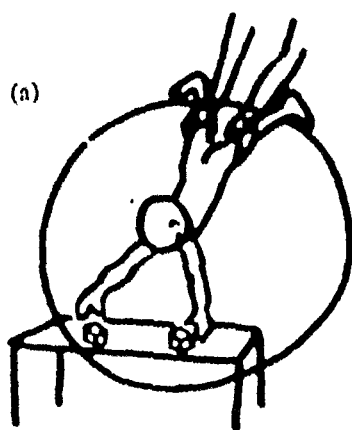
*Figure 123.* The child plays on the floor. His mother controls him at the shoulders with her legs and at the same time provides stability at the hips with her feet.

A child also learns about colour in a definite sequence. First by learning a primary colour: this he will soon recognise, but when shown another colour in comparison he will be unable to identify the second. When he has learned to identify each of the four primary colours he will begin to match similar colours, describing them by name and, finally, *naming the colours of things around him.*

We hope that in the foregoing it has been made clear how 'play and learning', both to the normal and the cerebral palsied child, are essential, and that in the process they are being prepared for the basic 'learning experiences' which they will gain when they go to nursery school.

The following series of sketches illustrate some of the ideas which may help to utilise the child's 'play activities' indirectly, as a means of progress towards independence and as the basis for future learning. (Figs. 121-144 )





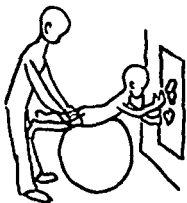
*Figure 125. Treatment on a ball (which originated at our Centre) used also for play.*

*Please note*—it is very important if you do use a ball that you see it is *well* blown up, and that you *control* the child accurately. A soft ball will only accentuate the child's difficulties. Slight movement will in itself help to decrease spasticity.

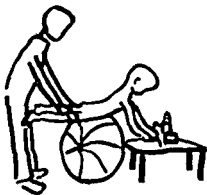
- (a) For the child who finds it difficult to lift his head, and straighten his back when he lifts his arms forward to play; lying on his tummy as illustrated is useful to get this combination of movements. Keep his hips and legs straight and turned out, watch to see the feet do not get stiff with the toes pointed downwards. Ideally the feet should be in the position shown. Some children may have legs that part too easily, if so, keep them together. Move the ball slowly sideways if you want rotation of arms and trunk and sideways movements of the head.
- (b) For the spastic child who finds it very difficult to sit in long sitting on the floor—a very important pattern. Sitting on the ball as illustrated is a useful preparation, movements sideways and backwards and forwards will encourage balance and adjustment of the position of the head. If his trunk is rather floppy, bumping him on his bottom will help give him stability.

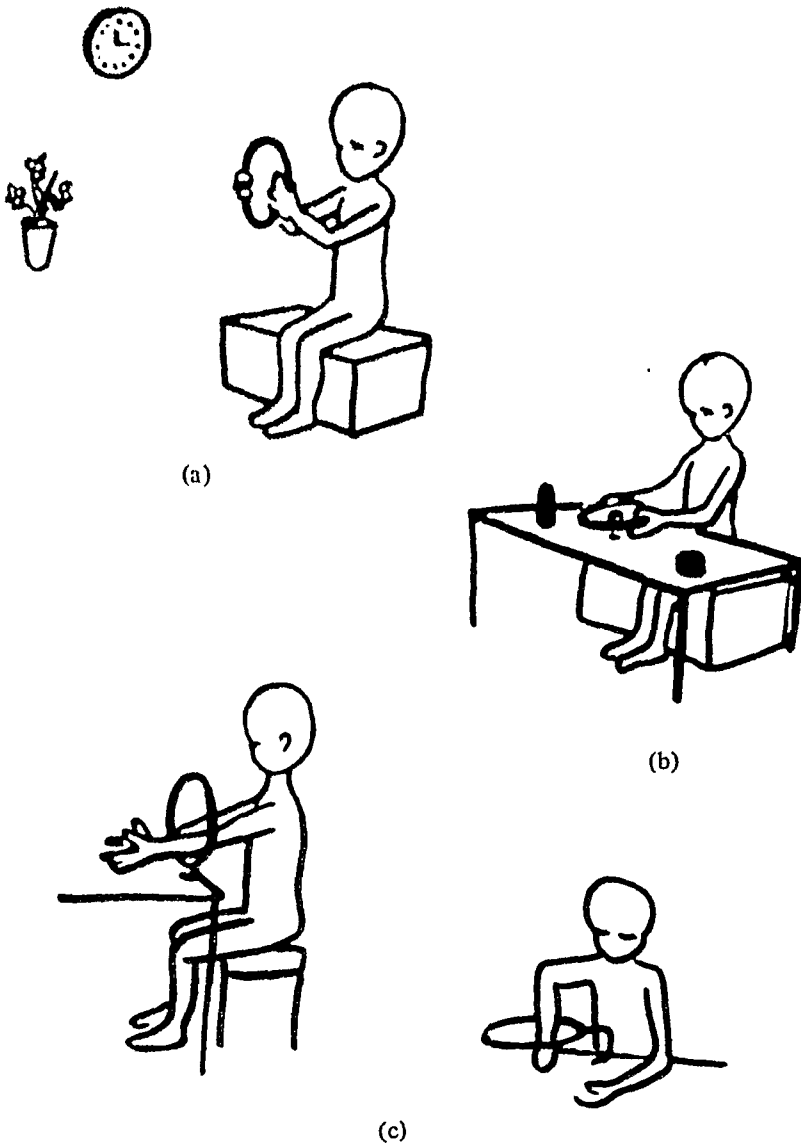


(a)



(b)





**Figure 127.** Play that needs good co-ordination between eye and hand.

(a) The athetoid child finds it difficult to grasp while he holds his arms steady and particularly difficult to keep his head still and look at what he is doing. When he first plays as illustrated you may have to hold his feet down for him.

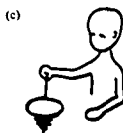
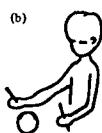
Using the ring as a camera and focusing it on different objects in the room. For the older child you can play 'I Spy' in this way.

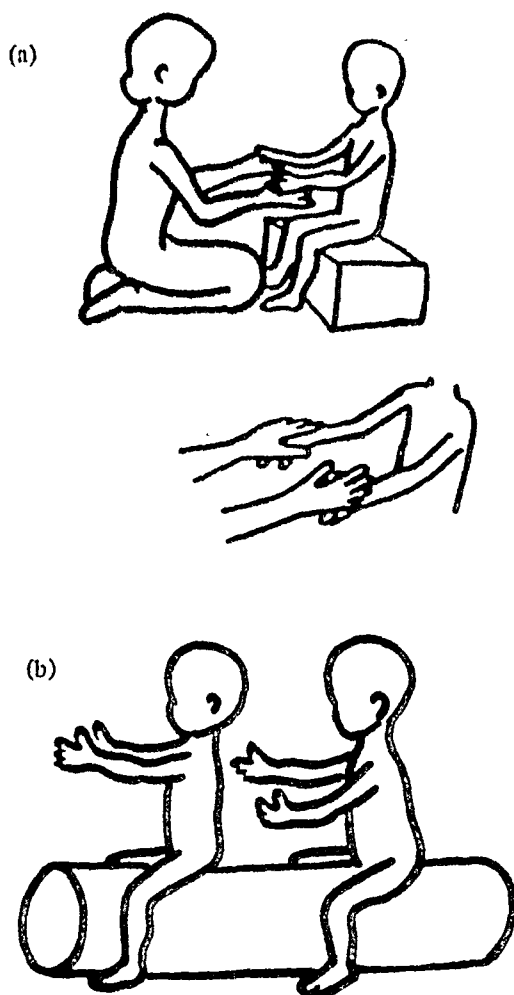
(b) Placing a ring over an object without touching it. A number of rings can be used and care must be taken to see that no ring touches the other.

(c) A ring clamped on the table as illustrated can be used if the child cannot use his hands, because his arms keep 'flying' outwards.



*Figure 128.* Play that needs good co-ordination between eye and hand.  
(a) Balancing one ball on another, using only the fingertips, then slowly moving the ball forward with the legs, while the small ball remains on top.  
(b) Moving a ball in all directions as the child walks about guiding it with a towel held in both hands.





*Figure 130*

- (a) The cerebral palsied child should learn to play games that involve commands (when lying on his back or tummy, sitting and standing). For example, 'put your arms above your head', 'down by your sides', 'straight out in front of you', 'place your hands on top of my hands; underneath' and so forth.
- (b) Equally important is that he should play games that do *not* require verbal commands and learn to rely on his ability to copy (as illustrated in this sketch) directly behind a child and then facing another child or adult.

(a)



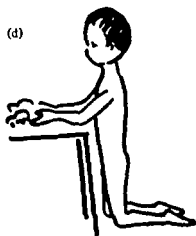
(b)

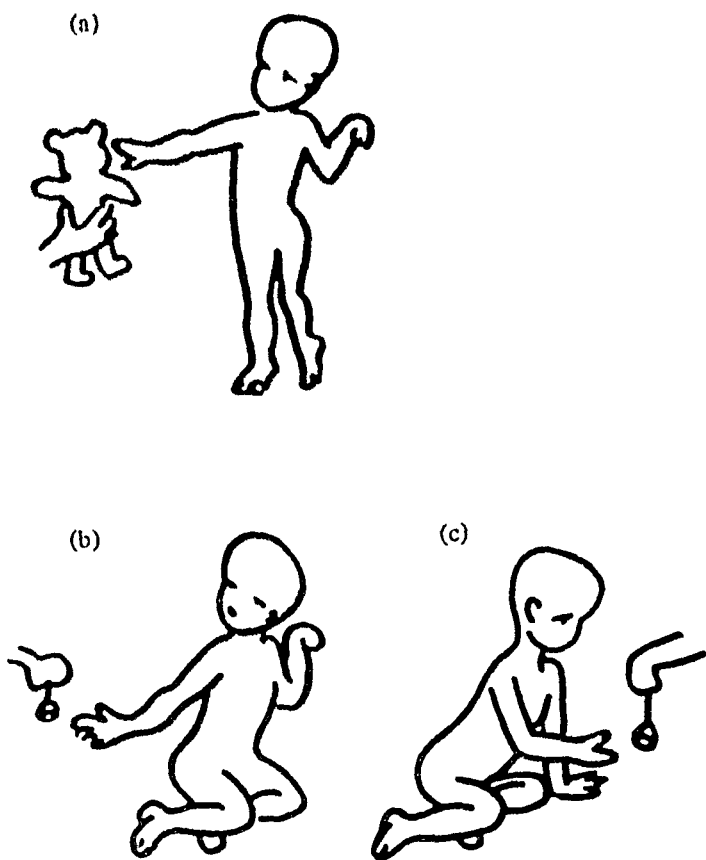


(c)



(d)





**Figure 132**

- (a) It is always important to take trouble when you hand toys or objects to a child to see that you are directly in front of him.  
 If you stand, for example, on his affected side as illustrated in fig. (a) you can see how the abnormal patterns of the whole of the affected side are reinforced, even the head is pulled more towards this side as the child looks and reaches out for his teddy bear.
- (b) Side sitting as illustrated in this sketch is a good position for the child to play in. It encourages him to take weight on the affected side (the left in our picture) while the whole of the side of the trunk is straightened. Again by *placing ourselves badly* the same reinforcement of the abnormal pattern takes place as in fig. (a) and the child will lose his balance and fall.
- (c) Illustrates how by placing toys and ourselves directly in front of the child he will be more symmetrical generally and have a better chance to use both hands whenever possible.  
 Please note in the sketch that the child is encouraged to take weight on his hand while at the same time he keeps his arm straight, turned out at the shoulder. This is an essential pattern, preparing the child for reaching forward with a straight arm to use his hand effectively.

(a)



(b)



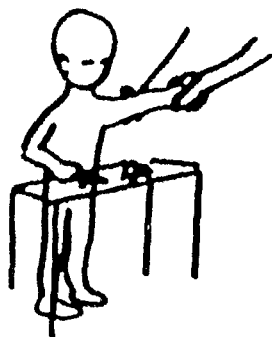
(c)



(d)



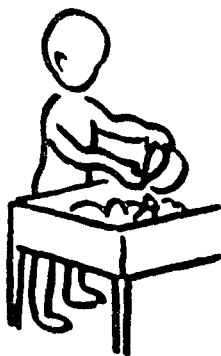
*Figure 153.* If the child, unless he is helped by you, can only hold a ball as illustrated in fig. (a), it is better to give him a stick, bat and ball, or hoop and ball to play with.



(a)



(c)



(b)

*Figure 134*

- (a) The hemiplegic child should also play when standing. If his arm is severely affected with strong 'associated' reactions, stop these as illustrated. The arm is held straight and turned out and up at the shoulder, the hand is held with the thumb out.
- (b) and (c) If the child plays with sand or water see that these are high enough in relation to him, so that he can stand up straight as he plays.





(a)



(b)



(c)



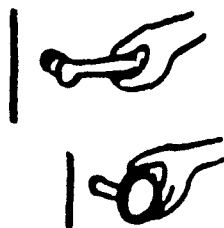
(a)



(b)



(c)



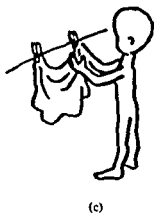
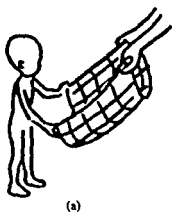
(e)



(d)

*Figure 136. Encouraging different types of hand movements:*

- (a) Open handed grasp needed to use a shoe brush or clothes brush.
- (b) Thinner handle of hair brush.
- (c) Grasp turning on and off a tap.
- (d) Index and thumb grasp, a much harder isolated movement combined with turning to wind kitchen clock.
- (e) Teach movements of the hands in a practical way, e.g. opening and closing doors.



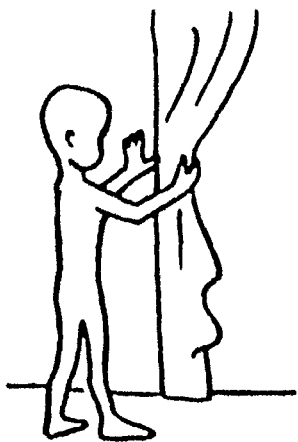
*Figure 137* Two-handed activities.

(a) Shaking and folding

(b) Holding and pulling, pushing and tucking in the blanket.

(c) Pegging clothes on a low line.

(d) Folding and tidying the towels.



(e)



(g)



(h)

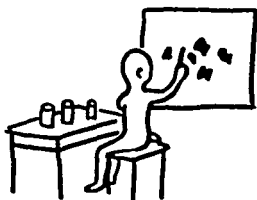


(f)



(i)

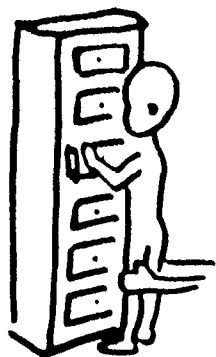
- (e) Opening and closing the curtains.  
 (f) Setting the table.  
 (g) Weighing things on a scale.  
 (h) Pouring, using both hands.  
 (i) Holding and lifting to sieve food, or drain out water.



*Figure 139. Washing and painting a large wooden or cardboard box using a painter's brush. The brush is easy for the child to hold and encourages him to make large sweeping movements.*



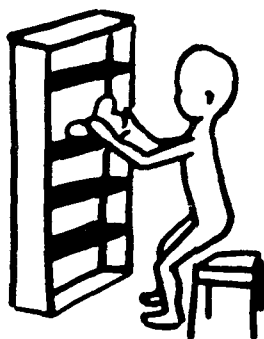
(a)



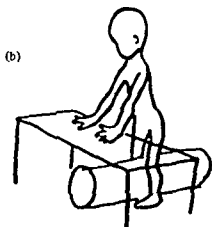
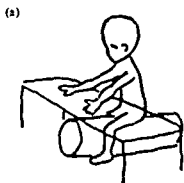
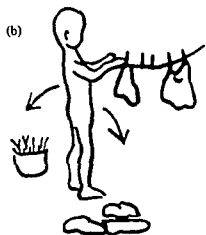
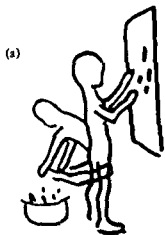
(b)

*Figure 140*

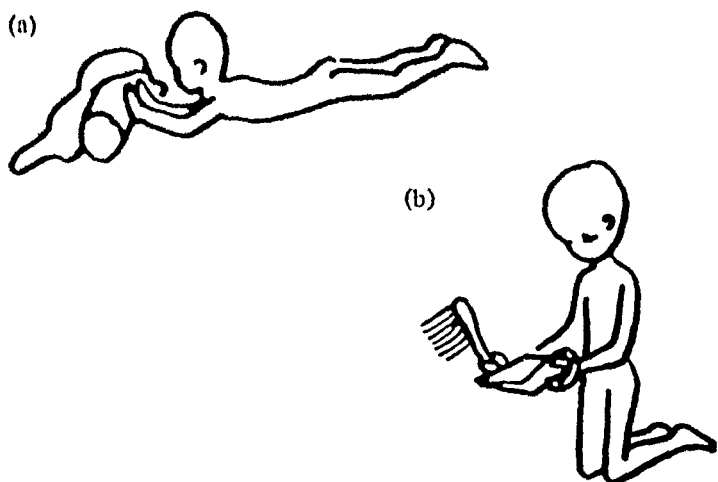
- (a) Playing in kneel standing position—keeping the hips straight and weight on both knees. If the child is rather 'wobbly' at the hips give pressure down as illustrated.
- (b) Making use of a cabinet with drawers at different levels. As the child explores you can stop at the height he finds the most difficult, or slowly get him to move up and down as he plays.



*Figure 141.* Give the child an empty bookcase or shelves to play on as a change from a table, again encouraging movement.



*Figure 143.* Sitting on a roller with a low table in front encourages the child to move from sitting to standing while he plays.



*Figure 144*

- (a) Encouraging the child to push with both hands while he lies on his tummy. Either an object as illustrated, or a game against a wall or mirror. This will give him the pattern of the arms necessary when using his hands, supporting himself or protecting himself when he falls.
- (b) Carrying his toys, or things for you around the house or on a small tray is good for eye-hand control. Getting balance in upright kneeling and walking on his knees is used in preparation for standing and walking later on.



## LINKING PLAY WITH EVERYDAY ACTIVITIES

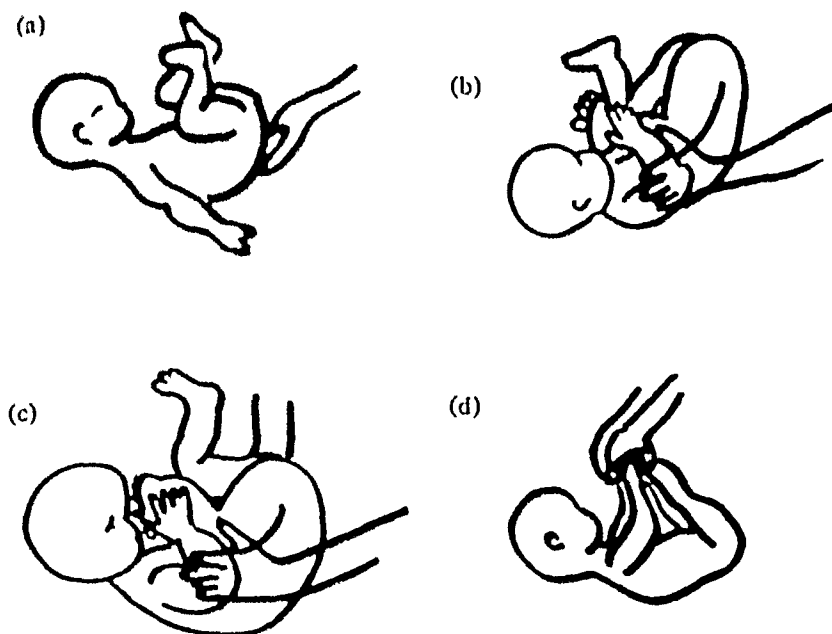
A normal child learns and practises, as he plays, many of the movements he needs for everyday activities such as washing, dressing and feeding. *You can help your child make use of play to learn these movements.* Examples of the link between play and such activities as dressing, washing and feeding will be given. These activities cannot be successfully done by your child on his own unless he is able to balance in sitting and does not have to rely on his hands for support keeping his feet flat on the floor at all times.

### *Play activities to help the child to learn to feed himself*

For the child who cannot bring his hand to his mouth, the following will be found useful in teaching him the first basic movements necessary for self-feeding.

Start by making sure that the child is in a symmetrical position, the head in mid-line, not pushing backwards or turned to the side, the shoulders and arms forward. Figs. 145-150, pages 182-185, illustrate a variety of positions that can be used and the children for whom they are most suitable.

How to place a child in a symmetrical position, taking both his arms and extending them with palms facing each other, is shown. If his



*Figure 145*

- (a) If the child is to be encouraged to look at and at the same time to hold his feet, see that not only the hips but the *lower part* of his spine are off the support. Many children when they try to reach out for their toes push their head back and this immediately straightens their hips and legs.
- (b) When the child takes his toes to his mouth see the the legs are bent and *turned out*, help by keeping his arms forward and up at the shoulder.
- (c) With the effort of taking his foot to his mouth the bending of one leg may make the other leg straighten and the child will often lose his balance. To prevent this happening have your other hand under the opposite hip. Work as quickly as possible to get him to hold *both* feet at once, taking one or both to his mouth.
- (d) A baby normally plays for many hours in this position, i.e. holding his toes while the legs remain straight and moving his legs up and down. Work for this pattern which is a good preparation for long sitting later on, but do see that the legs are *not* stiff or turned in.



*Figure 146.* The child takes your hands to touch his face, ears, shoulders and so on—give support with your knees only at intervals. When he starts to take his own hands to his face, control him under the top of his arms turning them out at the shoulders and stopping them pressing down.

It is important to encourage the child to look at his own hands, rubbing, the palms together, clapping them or banging the table, folding his fingers and drawing attention to them, drawing shapes on the front and back of his hands; playing with his hands in flour or water—these are a few of many ideas that can be used. Any movement of the hands should be practised, with the arms in various positions, starting by using both hands together, and then one hand slowly while the other remains flat on the table or grasps the side of the table.

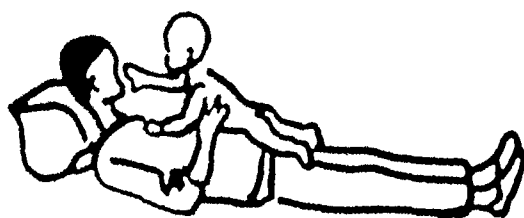


*Figure 147* A good position for the spastic child who finds it difficult to sit with his hips bent, legs straight apart and turned out. Controlling his legs with yours in this way leaves your hands free to help him.

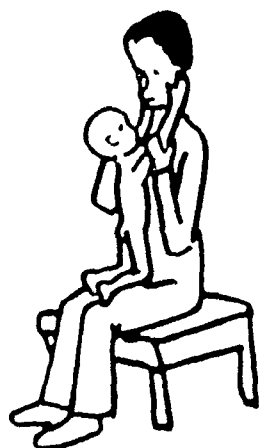
*Note* Both his hands are placed on his ears in this instance with open hands, he should progress to holding onto his ear lobes with finger and thumb. The palm facing towards the face. If his elbows start to pull in, change your grip and support him under the upper arm, keep his elbows out.

Awareness of his hands can be stimulated by rubbing both sides of the hand, between the fingers and even up the forearm, with a fairly stiff brush or any other *lightly* abrasive material. This method is also useful when applied to the cheeks, nose or ears, as the child will often then automatically bring his hands to his face. At times rub the back or front of his hands with the brush to draw attention to them; this may even encourage him to push the brush away. The best results will be obtained when the child can hold the brush and rub his own hand and arm; he will then be much more aware of the stimulus.

Whilst the foregoing is directed mainly towards self-feeding, it will be seen that it also serves another purpose, i.e. to get the child to know and feel the various parts of his body. This knowledge is essential if he is to learn how to move or to understand that his head is at the top of



(a)

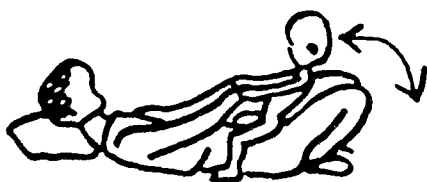


(b)

*Figure 148*

(a) and (b) The young child in the sketch practises lifting his head while at the same time he straightens his back as he learns to reach out and touch Daddy's face.

*Note:* He is held under the chest, the shoulders are kept up and forward and weight is taken by the child on one arm while he reaches out with the other.



*Figure 149.* A spastic child with poor head and trunk control sits astride his father who gives support to the child's back with his legs. The father moves his legs sideways teaching the child to make the necessary adjustment of his head and trunk as he learns to balance in preparation for sitting without support and to be able to use his hands. The child is encouraged to grasp his father's hands, keeping his arms straight out in front of him.

*Note:* If the child's arms feel heavy and push down, take his arms above his head, keeping them straight and turned out at the shoulder.

his body, his feet at the end, that he has a back and a front, and so on: information that is important to future learning. The child must also know the parts of his body before he can start to wash, dress and feed himself.

The learning of body awareness is a very important milestone in the development of both normal and cerebral palsied children, and your occupational therapist will give you advice on the sequence of development that should be followed.



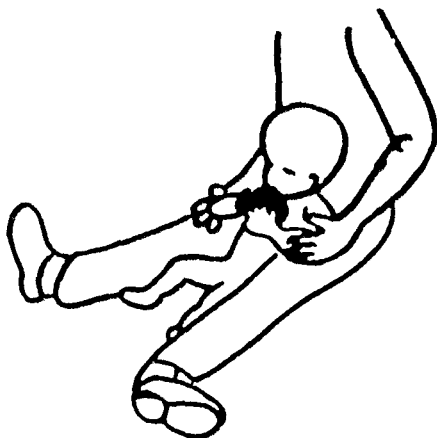
(a)



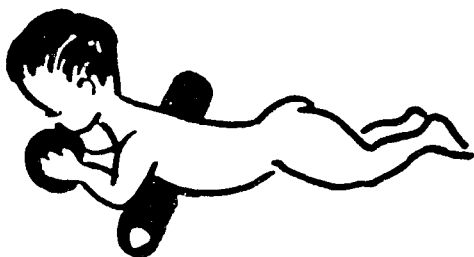


*Figure 151.* To open a fisted hand *never* pull the thumb back, see first that the arm is turned out at the shoulder as explained in Chapter 2, page 58, Fig. 31 (c). Keep the hand open by grasp illustrated.

(a)



(b)

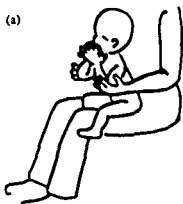


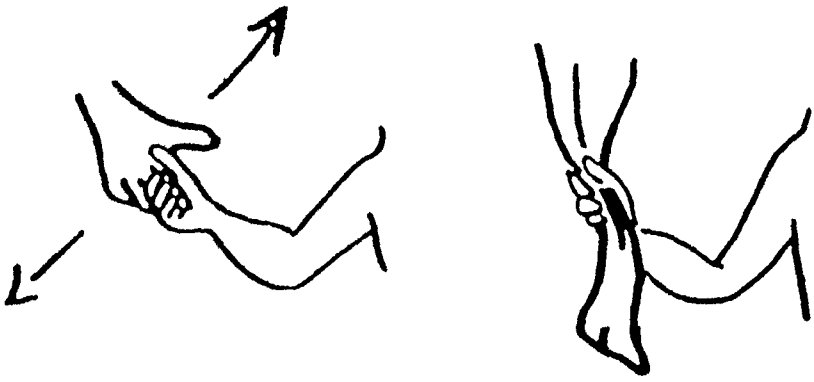
*Figure 152.* A variety of positions to encourage the child to hold and bring an orange towards his mouth.

- (a) Sitting between your legs, the child's head and shoulders can be kept forward and your legs help to keep the arms away from his body. Support under the elbows enables the child to lift the orange to his mouth.
- (b) The child lies over a roller which keeps his arms forward at the shoulder and brings the orange to his mouth instead of vice versa. He may need help to keep his hips down.

In these various ways we are extending all the time the child's awareness of his own body, and the relationship of the parts to the whole.

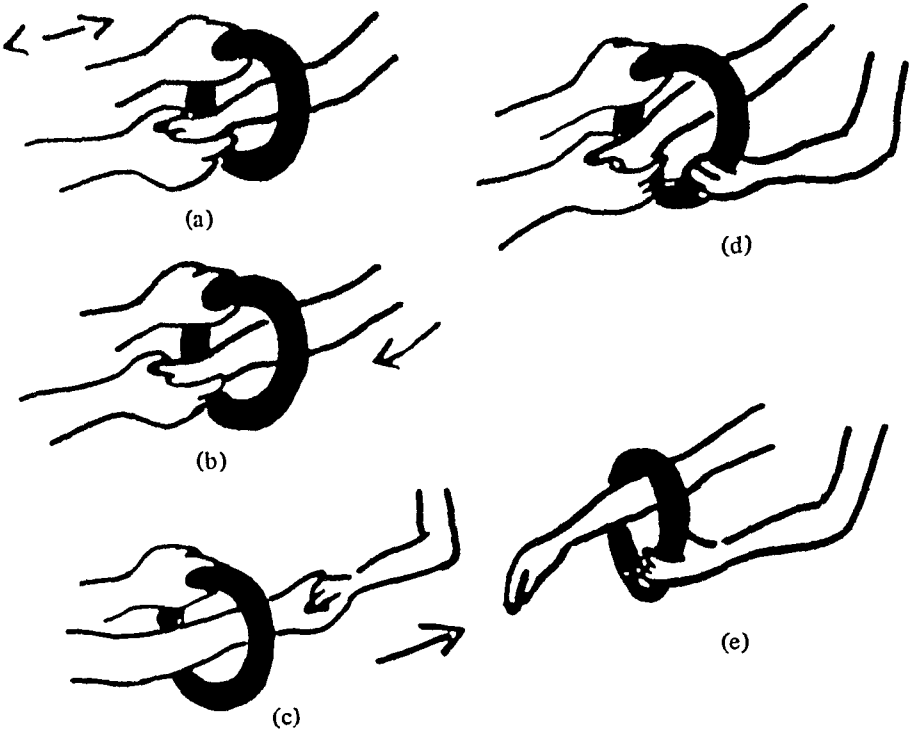
The pattern of movements underlying feeding is the ability to take the hands to the mouth, either with the food held in the hands, as one does with a biscuit, or when using a spoon and fork. To be able to do this independently, head control and good balance in sitting are necessary. To begin with the child may need to be tied around the waist, or groin straps may be used to fix him at his hips in his chair.





*Figure 154.* By grasping your fingers and later by holding a towel in his hand, the child's arm can be moved in all directions while he tries to retain his grasp. This can be followed by the child moving your arm in all directions while you hold the towel. The child should only practise the movements in a position in which he has good balance and does not need an arm to support himself.

*Note:* Your finger and the towel are placed across the palm and then out between the thumb and index finger.



*Figure 155*

(a) Grasp the child's hand and the ring.

(b) Pull the child's arm through the ring taking the ring up to his shoulder while he says *push*.

(c) Pushing the child's arm out of the ring while he says *pull*.

(d) The child holds the ring and your hand, and he pulls and pushes with your help.

(e) Finally he holds the ring on his own and repeats the same movements.



most children like. Make a small hole at the top of the orange and enlarge this as the child becomes more proficient (see Figs. 153 (a) and (b)).

Gradually food of different shapes and textures can be given to the child. For example, a long roll dipped in honey or peanut butter, according to taste; or smaller and softer foods such as banana, sausage, cheese straws or partially cooked carrots, whichever tempts him.

As soon as he is able to hold a spoon, give him one to play with: to begin with a wooden spoon is the best. When he has reached the stage of sitting in a chair and is with you in the kitchen, give him a pudding basin, putting into it various things such as flour, rice, sugar; he will



Figure 156

- (a) The same sequence of movements, the child lying on his back. Here he pulls and pushes the ring over his leg.  
(b) The same sequence of movements done in sitting on the floor.

soon learn to stir and try to lift the contents on to his spoon. A second basin will encourage him to grasp the idea of lifting a full spoon from one bowl to another, and he may even be tempted to try to taste. Games of pouring the contents from one basin to another are all ways of achieving a carefully co-ordinated movement.

When the child reaches the stage of using a fork, give him a chance to practise pushing it into various thicknesses of food by cutting up thick squares of bread with his favourite spread, pieces of sausage, cheese and so on.

Play activities to help the child to learn to dress and undress

The movements of the arms and hands necessary for dressing and undressing are.

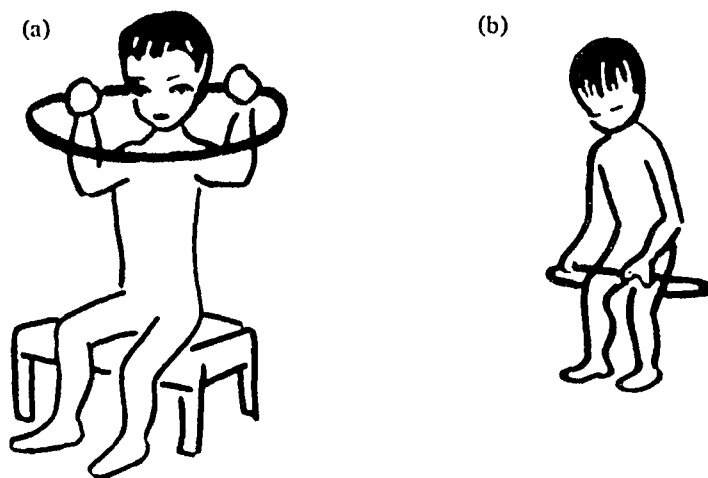
- (1) To be able to bring the arms towards the body with the palms facing the body, whether the arms are straight or the elbows bent. We

mention this because your child may perhaps be able to bring his arms towards his body, but with the back of his hands facing his body, making it impossible for him to use them.

- (2) The ability to grasp and push, and to grasp and pull with one or both hands, and grasp and lift with the arms either straight or bent regardless of the position of the head; also to be able to lift his arms above his head and behind his neck, and of course the ability to lift his arms without falling backwards, a difficulty common to most cerebral palsied children.

One way of encouraging these movements is by using, at first, your fingers or a towel to grasp (see Fig. 154, page 188); later a rubber quoit ring, hoop, or a large rubber ring of the type a child uses when he is learning to swim. Figs. 155 (a) to (e), page 188, show how this can be done and the way to progress. With the more severely handicapped child these series of movements can be practised while he lies on his back. (Figs. 156, page 189, see also Figs. 157, 158).

In addition, dressing up in clothes that are too large for him, and dressing and undressing his dolls, are both fun and useful activities. We have found that, by making a set of simplified loosely-fitting clothes for



*Figure 157*

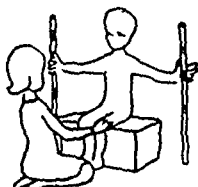
- (a) Sitting on a stool pushing a 'swimming ring' over and above his head and pulling it down again, finally as far as his waist. This is a preparation for taking off and pulling on clothes over his head.
- (b) Pulling the hoop from his feet up to his waist and pushing it down again; preparation for putting on trousers, pants and so on.

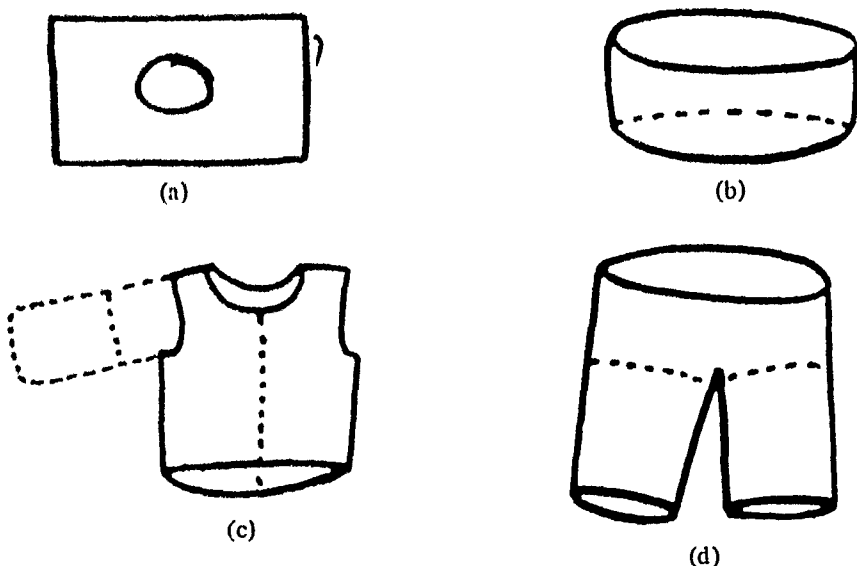
him, the more severely handicapped child can practise with them and soon acquires the idea as to what is required of him before he starts to take off and put on his own clothes which will be of a tighter fit. Figs. 159 (a)-(d), page 192, show how this is done.

#### Play activities to help the child to learn to wash himself

The movements necessary for washing are similar to those required for dressing. The child must also be able to hold a sponge or flannel, to move his arm up and down and across his body, and to rub.

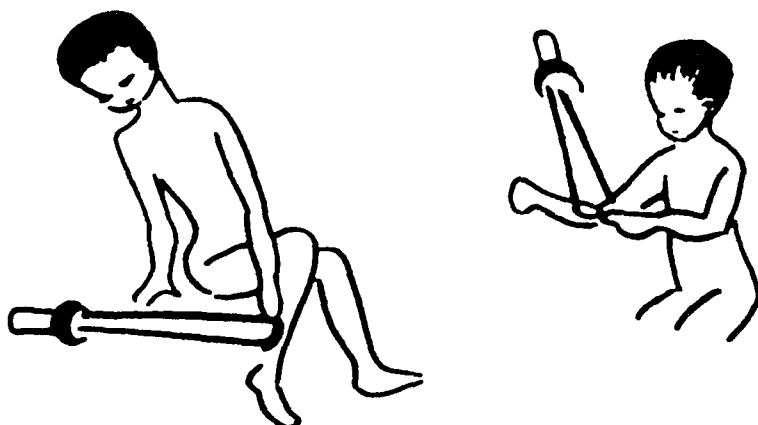
When playing outside the bath, choose a position where the child's balance is good—a chair is often easier for him to sit on than the floor—as bathing especially calls for quite a lot of adjustment of balance. Use a torch to shine on different parts of his body and move the light rapidly and unexpectedly. In this way you will encourage him to look





*Figure 159.* As an intermediate stage between playing with the ring and actually dressing and undressing himself we have found the following idea useful. These garments should all be made outsized for the child.

- (a) Cut a hole in a rectangular piece of material and leave the sides unsewn. The child puts it over his head, the material covering his front and back.
- (b) The depth of the material illustrated will vary according to the size of the child, it should be large enough to reach from his armpits to the top of his hip bone. To put it on he has to first get it over his head and then get his arms through.
- (c) The dotted lines show how a sleeveless blouse can be made more complicated by the addition of sleeves and a front opening; each garment is made separately. A variety of fasteners and different sized buttons can be sewn on to give the child practice.
- (d) A simple pair of pants can gradually have legs added, also openings in front.



*Figure 160.* Shine the torch on the child's leg and then get him to look and touch. Move the light about quite quickly so that he moves and looks for the light at the same time. Follow this by getting him to rub the spot.

where the light is shining (see Fig. 160, page 192). Get him, first, to rub that part with his hand, then wet and soap his hand, or get him to use a glove flannel to rub himself. This can be followed by getting him to hold a tissue and finally a wet sponge or flannel with which to rub himself. You will find that he will manage to wash his hands and face and arms first, then his tummy and legs. Go slowly at first; use upright kneeling if he balances better in this position than in sitting. If he should find it difficult to bring his hands to his body, give him the idea of the movement of rubbing by letting him wash your hands and arms or his dolls or toys, and then his own.

## GLOSSARY

**Associated reactions:** These are also referred to as 'associated movements'. If a child uses undue effort to move a limb there is often an increase in spasticity in the rest of the body. For example, if a Hemiplegic child squeezes an object with his sound hand, spasticity will increase in the affected arm and hand causing the hand to clench and the elbow to bend.

**Asymmetrical:** One side of the body is different in attitude and action from the other. For instance, the head is always or frequently turned to one side, one arm remains flexed and fisted and the child does not use it. He may also kick only with one leg.

**Ataxic:** Wobbly and having no balance.

**Athetosis:** There are many varieties of this condition and one refers to them all under the term of 'the athetoid group'. All types in this group have in common an unstable type of muscle tension which makes it impossible for the child to keep still. When he is at rest and comfortable the tension is often too low and the child will then have great difficulty in starting to move. If, on the other hand, he becomes excited or tries to do something that is difficult for him he may become very stiff. This instability of muscle tensions therefore interferes with any attempted movement.

**Cerebral palsy:** The generic title of a condition due to damage to the brain occurring in earliest childhood. This disturbs the normal co-ordination of the muscles of the body and makes it difficult or impossible to maintain normal postures and perform normal movements and skills. Those suffering from cerebral palsy are divided into the following main groups: Spastic, Athetoid, Ataxic, Hyperkinetic.

**Co-ordination:** The patterning of the action of the muscles of the body, i.e. their 'working together' is controlled by the brain and is necessary for the maintenance of posture, for balance and the performance of movements.

**Diplegia:** Another type of cerebral palsy where the whole body is affected. The lower parts, that is, the legs and lower trunk, are more severely involved than the head and arms. The children usually use their arms and hands quite well and have good control of the head and fair or normal speech.

**Extension:** Stretching of any part of the body.

**Facilitation:** A technical term used in many treatment techniques. Normal automatic patterns of muscle action, such as the lifting of the head, rolling over from back to tummy, sitting up and balance reactions, are obtained by special techniques of handling the child.

**Flaccid Floppy**—See Hypotonia.

**Flexion:** Bending of any part of the body.

**Hemiplegia:** A type of cerebral palsy in which one half of the body is involved only. It is usually this type which shows asymmetry most clearly.

**Hypotonia ('Floppiness'):** In some children brain damage leads to a state of tension of their muscles which is too low. They cannot therefore maintain any postures against gravity, and they cannot start a movement.

**Inhibition:** A technical term of treatment. Special techniques of handling are aimed at stopping the spastic or athetoid patterns which prevent or interfere with normal activity.

**Muscle tone:** The state of tension in our muscles at rest and when we move. This is regulated under normal circumstances subconsciously in such a way that the tension is sufficiently high to withstand the pull of gravity, i.e. to keep us upright, but it is never too strong to interfere with our movements.

**Patterns of movement:** In every movement and change of posture produced by it, the brain throws muscles into action always in well-co-ordinated groups, that is, patterns.

**Posture:** Is the assumption and maintenance of various attitudes in spite of the pull of gravity. Movements of our body produce constant changes in the pull of gravity, and adaptations of our posture during movement takes place automatically and constantly to avoid falling.

**Quadruplegia:** Another type of cerebral palsy in which again the whole body is involved. Here the upper parts are more affected than the lower. The children usually have poor control of the head and limbs, poor speech, and difficulty in looking at things.

**Spasticity:** The muscles become stiff, their tension is too high. This is the direct result of the damage to the brain. As the patient either cannot move at all or only with great effort to overcome the stiffness of his muscles, he is more or less fixed in certain abnormal postures.

**Spatial.** Orientation in space by vision and movement.

**Symmetrical:** The postural patterns of both sides of the body are alike and therefore movements can also be performed in the same way. If, for example, the head is in the middle, the hands can be brought to the mouth, both arms can reach out, and the legs also have the same attitude.

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